EPSON©

User's Guide

Read This First

Before you set up your EPSON® EL 486UC+ computer, read this card for guidelines on how to get started. Also keep it around for future reference because it provides important information about your system and how to get technical assistance when you need it.

Setting Up Your System

Most systems sold by EPSON Direct" are preconfigured; all the hardware and software (such as MS-DOS® and Microsoft® Windows™, is already installed. However, be sure to follow these general procedures when setting up your system:

1. **Install any internal options.** If you purchased additional, optional equipment that goes inside the computer—such as option cards, memory modules, a hard disk, or a diskette drive-you should install these devices first. See Chapters 4 and 5 in your User's *Guide* for instructions.

2. **Set up the computer.** Follow the steps in Chapter 1 of the User's *Guide* to connect your system components and in Chapter 2 to run the SETUP program.

3. **Install your Windows applications and other software.** Install any Windows applications and other software programs you plan to use. See the documentation that came with the application programs for instructions.

> **Note**
> Be sure to make backup copies of all the diskettes you use to set up your system and install your software.

4. **Install VGA device drivers and utilities.** If you have a monitor that supports resolutions over 640 x 480, you'll probably want to use some of the VGA device drivers and utilities that came with your computer to enhance the display capabilities of your built-in VGA adapter. Drivers for Windows have been installed on the hard disk. To install additional drivers, see the README file on the Utility diskette for instructions.

Where to Get Help

EPSON provides the following support services through EPSON Direct and the EPSON Connection:""

☐ Technical assistance with the installation, configuration, and operation of EPSON products

☐ Assistance in locating your nearest Authorized EPSON Customer Care Center

☐ Assistance with Extra Care Road Service

☐ Sales of accessories, manuals, or parts for EPSON products through EPSON Accessories at (800) 873-7766

☐ Customer relations

☐ EPSON technical information library fax service

☐ Product literature on current and new products.

If you need help with any software you are using, see the documentation that came with it for technical support.

EPSON Direct: (800) 374-7300

EPSON Connection: (800) 922-8911

CompuServe On-line Support

If you have a modem, the fastest way to access helpful tips, specifications, drivers, application notes, tables for DIP switch or jumper settings, and bulletins for EPSON products is through the Epson America Forum on CompuServe.®

If you are not currently a member of CompuServe, you are eligible for a free introductory membership as an owner of an EPSON product. This membership entitles you to:

☐ An introductory $15 credit on CompuServe

☐ Your own user ID and password

☐ A complimentary subscription to *Compu Serve Magazine,* CompuServe's monthly publication.

To take advantage of this offer, call (800) 848-8199 in the United States and Canada and ask for representative #529. In other countries, call the following U.S. telephone number: **(614) 529-1611,** or your local CompuServe access number.

If you are already a CompuServe member, simply type GO EPSON at the menu prompt to reach the Epson America Forum.

Important Record Information

Take a moment to write down some important information about your system. You can easily refer to this card if you call for assistance.

Computer serial number: _____

Purchase date: _____

Monitor serial number: _____

Printer serial number: _____

Otherdevice serial number: _____

Otherdevice serial number: _____

Option cardsinstalled:

Slot l: _____   **Slot** 2: _____

Slot 3: _____   **Slot** 4: _____

Slot 5: _____

MSDOSversion and serial number: _____

Windowsversion and serial number: _____

Software program	Version number	Serial number

Important Safety Instructions

Read all of these instructions and save them for later reference. Follow all warnings and instructions marked on the computer.

- Unplug the computer before cleaning. Clean with a damp cloth only. Do not spill liquid on the computer.

- Do not place the computer on an unstable surface or near a radiator or heat register.

- Do not block or cover the openings in the computer's cabinet. Do not insert objects through the slots.

- Use only the type of power source indicated on the computer's label.

- Connect all equipment to properly grounded power outlets. Avoid using outlets on the same circuit as photocopiers or air control systems that regularly switch on and off.

- Do not let the computer's power cord become damaged or frayed.

- If you use an extension cord with the computer, make sure the total ampere rating of the devices plugged into the extension cord does not exceed the cord's ampere rating. Also, make sure the total of all devices plugged into the wall outlet does not exceed 15 amperes.

- Except as specifically explained in this User's *Guide,* do not attempt to service the computer yourself. Adjust only those controls that are covered by the operating instructions.

- Unplug the computer and refer servicing to qualified service personnel under the following conditions:

  If the power cord or plug is damaged; if liquid has entered the computer; if the computer has been dropped or the cabinet damaged; if the computer does not operate normally or exhibits a distinct change in performance.

- If you plan to use the computer in Germany, observe the following:

  To provide adequate short-circuit protection and over-current protection for this computer, the building installation must be protected by a 16 Amp circuit breaker.

  Beim AnschluB des Computers an die Netzversorgung muB sichergestellt werden, dab die Gebäudeinstallation mit einem 16 A Überstromschutzschalter abgesichert ist.

Importantes instructions de sécurité

Lire attentivement les instructions suivantes et les conserver pour les consulter en cas de besoin. Observer soigneusement tous les avertissements et directives marques sur l'ordinateur.

- Debrancher l'ordinateur avant de le nettoyer. N'utiliser qu'un chiffon humide. Veiller a ne pas renverser de liquides sur l'appareil.

- Ne pas placer l'ordinateur sur une surface instable ni près dune source de chaleur.

- Ne pas bloquer ni couvrir les orifices d'aération de l'appareil. Ne pas introduire d'objets dans les ouvertures.

- Utiliser seulement le type de source d'alimentation électrique indiqué sur l'etiquette.

- Tout l'equipement doit être branche sur des prises de courant avec contact de terre. Ne jamais utiliser une prise sur le même circuit qu'un appareil a photocopies ou un systeme de contrôle de ventilation avec commutation marche-arrêt automatique.

- S'assurer que le cordon d'alimentation de l'ordinateur n'est pas abîmé ni effiloché.

- Dans le cas ou on utilise un cordon de rallonge avec l'ordinateur, s'assurer que l'intensite en amperes requise pour tous les appareils branches sur ce cordon ne soit pas superieure a la capacite du cordon. S'assurer aussi que cette intenste ne depasse jamais la somme de 15 amperes pour l'ensemble des appareils.

- Sauf dans les cas specifiques expliques dans ce manuel de l'usager, ne pas essayer d'entretenir ou de reparer l'ordinateur soi-même. N'ajuster que les commandes décrites dans les directives.

- Debrancher l'ordinateur et contacter un technicien qualifié dans les circonstances suivantes:

   Si le cordon ou la prise sont abimes; si un liquide a pénétré a l'interieur de l'appareil; si on a laisse tomber l'appareil ou si le boîtier est endommage; si l'ordinateur ne fonctionne pas normalement ou fonctionne d'une manière tres différente de l'ordinaire.

- Pour utiliser l'ordinateur en Allemagne, il est nécessaire que le batiment soit muni d'un disjoncteur de 16 amperes pour proteger l'ordinateur contre les courts-circuits et le survoltage.

Introduction

Your new EPSON® computer offers the following features:

☐ Intel® 486SW 25 MHz, 486DW 33 MHz, 486DX2/ 50, or 486DX2/ 66 MHz microprocessor

☐ 4MB of internal memory, expandable to 64MB

☐ System and video BIOS shadow RAM

☐ SKI3 of internal processor cache, with support for 64KB, 128KB, or 256KB of external cache

☐ 512KB of on board video memory, expandable to 1MB

☐ Math coprocessor built into the microprocessor on the DX and DX2 systems

☐ Built-in VGA port

☐ Two built-in serial ports and one built-in parallel port

☐ One built-in PSI 2™compatible keyboard port and one built-in PS/ 2 compatible mouse port

☐ Three 16-bit, full-length and two 8-bit, half-length ISA option slots (if your system has a DXor DX2 processor, access to the bottom 16-bit slot may be restricted by the heat sink/ fan assembly on the processor)

☐ Support for up to four storage devices (two externally accessible and two internal)

☐ Password security.

Using the built-in interfaces, you can connect most of your peripheral devices directly to the computer, so you do not have to install option cards. You can use the option slots to enhance your system with extra functions such as a modem card, a network controller card, or additional interface ports.

The shadow RAM feature speeds up processing by moving the system and video BIOS into the RAM area of memory.

With the standard 512KB of video RAM, the VGA controller supports standard resolutions up to 640 x 480 in 16 colors and extended resolutions up to 640 x 480 in 256 colors or 1024 x 768 in 16 colors (interlaced or non-interlaced). When you upgrade to 1MB of video RAM, the system supports extended resolutions up to 1024 x 768 in 256 colors.

Your system may have been configured for you. If so, everything you need to get started is already in place. Your hardware configuration options have been set to ensure optimal system performance. The hard disk drive already contains the MS-DOS®operating system and Microsoft@ Windows.™In addition, the drivers needed to take advantage of your system's enhanced video resolutions have been installed for you. Just connect your keyboard, mouse, and monitor and you're ready to go.

VGA Drivers

Your computer comes with VGA drivers for use with the integrated VGA interface. With these drivers, you can take advantage of the extended VGA features such as high resolutions and 132-column text mode when you run popular application programs. If your system was configured for you, these drivers are already installed. If you need to install them yourself, a README file on your Utility diskette describes how to install the VGA drivers for common application programs.

Optional Equipment

You can easily upgrade your computer by installing additional memory and a wide variety of options, as described below. (Installation instructions are provided in Chapters 4 and 5.)

System Memory

By adding 4MB, SMB, 16MB, and 32MB SIMMs (single inline memory modules) to the main system board, you can expand the computer's memory up to 64MB.

Cache Memory

You can increase your cache memory to 64KB, 128KB, or 256KB by installing SRAM chips on the main system board. Additional cache allows your system to access frequently used data faster, improving overall system performance.

Video Memory

You can install video memory chips to increase the video memory to lMB, allowing you to use higher resolutions with more colors.

Microprocessor

You can upgrade your system with these microprocessors:

    486SXJ 33
    486DW 33
    486DX2150
    486DX2166.

Math Coprocessor

You automatically install a math coprocessor when you
upgrade your system with a DX or DX2 microprocessor,
because a math coprocessor is built into the 486DX and 486DX2
chips.

Drives

Your system can support up to four mass storage devices,
including hard disk drives, diskette drives, a tape drive, a
CD-ROM drive, or an optical drive. As your storage needs
expand, you can install additional drives. Some restrictions
apply however; see Appendix A for more information.

How to Use This Manual

This manual contains the information you need to get the best
results from your computer. You don't have to read everything
in this book; see the following chapter summaries to find the
sections you need.

Chapter 1 provides simple instructions for setting up your
system and connecting peripheral devices such as the monitor
and printer.

Chapter 2 describes how to run the SETUP program to define
your computer's configuration. You may need to do this the
first time you use your computer, or later if you change the
configuration.

Chapter 3 covers general operating procedures, such as
resetting the computer, using the password, and changing the
processor speed.

Chapter 4 describes how to remove and replace the computer's cover, change jumper settings, and install optional equipment such as microprocessor upgrades, option cards, and memory modules.

Chapter 5 explains how to install and remove disk drives.

Chapter 6 contains troubleshooting tips.

Appendix A lists the specifications of your computer and the operating environments that have been tested on your system.

At the end of this manual you'll find an **Index** and a list of U.S. and international marketing locations.

Conventions Used in This Manual

This manual uses the following conventions in the text:

Example	Meaning
Enter	Keys you press on the keyboard
Ctrl C	Keys you press at the same time; hold down the key marked Ctrl and press the letter C
`C:\DOS`	Text as it appears on the screen
`DISKCOPY A: B:`	Text that you type exactly as shown
path\filename	Words printed in lowercase italics represent optional parameter names; here you would type the actual path and filename, such as \WORK\CONTACT
COM1	Names of labled hardware elements

Where to Get Help

If you purchased your computer in the United States or Canada, EPSON provides customer support and service through a network of Authorized EPSON Customer Care Centers. EPSON also provides support services through the EPSON Connection." In the United States, dial (800) **922-8911.** In Canada, dial (800) **GO-EPSON.**

Call the EPSON Connection for the following:

☐ Technical assistance with the installation, configuration, and operation of EPSON products

☐ Assistance in locating your nearest Authorized EPSON Reseller or Customer Care Center

☐ Customer relations

☐ EPSON technical information library fax service

☐ Product literature on current and new products.

You can purchase accessories, manuals, or parts for EPSON products from EPSON Accessories at (800) 873-7766 (U.S. sales only). In Canada, call (800) **GO-EPSON.**

When you call for technical assistance, be ready to identify your system and its configuration, and provide any error messages to the support staff. See Chapter 6 for more information.

If you purchased your computer outside the United States or Canada, contact your EPSON dealer or the marketing location nearest you for customer support and service. International marketing locations are listed at the end of this manual.

If you need help with any software application program you are using, see the documentation that came with that program for technical support information.

CompuServe On-line Support

If you have a modem, the fastest way to access helpful tips, specifications, drivers, application notes, tables for DIP switch or jumper settings, and bulletins for EPSON products is through the Epson America Forum on CompuServe.®

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Appendix A **Specifications**

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Chapter 1

Setting Up Your System

This chapter briefly describes how to set up your computer. It includes the following information:

☐ Getting started

☐ Connecting peripheral devices

☐ Turning the computer on and off.

Getting Started

Follow the instructions below for choosing a location for your new system and unpacking it.

Choosing a Location

When you are ready to set up your system, choose a safe, convenient location that provides the following:

☐ A flat, hard surface. Surfaces like beds and carpets attract static electricity, which can erase data on your disks, damage the computer's circuitry, and prevent proper ventilation.

☐ Moderate environmental conditions. Select a cool, dry area and protect your computer from extremes in temperature, humidity, dust, and smoke. Avoid direct sunlight or other sources of heat.

☐ Good air circulation. Leave several inches of space around the computer so air can move freely.

❏ No electromagnetic interference. Do not place your system too close to any electrical device, such as a telephone or television, which generates an electromagnetic field.

❏ Appropriate power source. Connect all your equipment with the appropriate power cords for the power source in your area.

Unpacking Your Computer

When you unpack your system components, make sure you have these items:
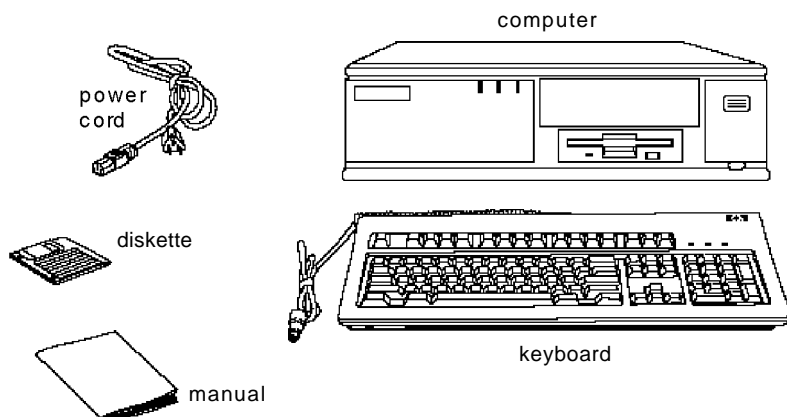
Your system may also include an EPSON PS/2 compatible mouse and may come with the operating system and software already installed on a hard disk drive.

If you purchased any optional equipment that wasn't installed at the factory—such as option cards, memory modules, a hard disk, or a diskette drive-you install these options before you connect your computer. See Chapters 4 and 5 for instructions.

Connecting Peripheral Devices

Use the illustration below to locate the ports on the back of
your system as you connect the keyboard, monitor, printer, and
other devices.

monitorcable

monitor
power inlet

K/B   COM1 COM2   VGA

power inlet   poweroutlet   MOUSE   PA RA LLEL
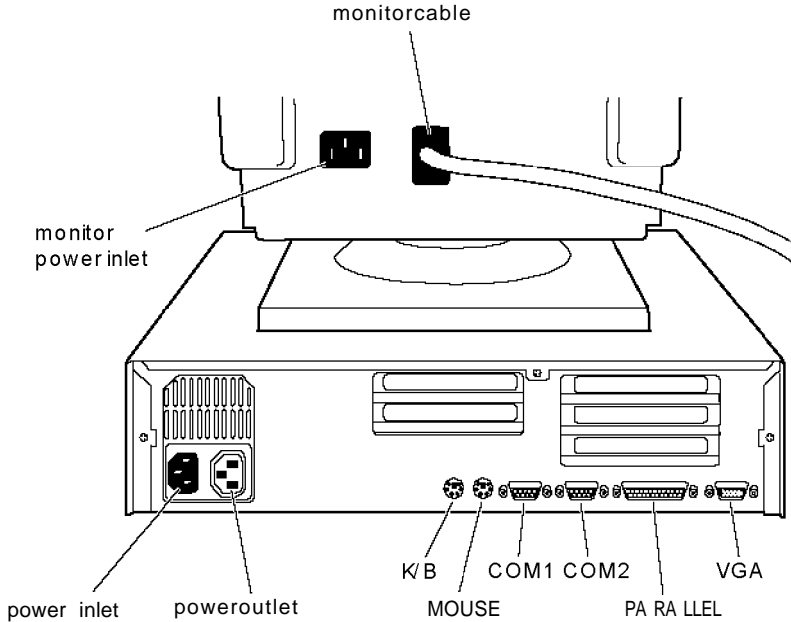
Connecting a Keyboard

To connect a keyboard, hold the cable connector so the arrow
on the connector faces up. Insert it into the port marked K/B.

Connecting a Mouse

If your system came with an EPSON PSI 2 compatible mouse:
you connect it to the computer's built-in mouse port. To
connect the mouse, insert the connector into the port marked
MOUSE

> **Caution**
>
> Although the connectors and ports for the mouse and keyboard are physically identical, they cannot be used interchangeably. Be sure to plug the mouse connector into the MOUSEport, or you may damage your system.

If your system has not already been configured, you may need to install a mouse driver. See your mouse manual for instructions. (If you are using Windows, the mouse drive was automatically installed by the program.)

Connecting a Monitor

You can connect your VGA monitor to the computer's built-in VGA port as described below. (If you will be using a different type of monitor, connect it to the video adapter card installed in your system instead.)

1. Place your monitor on top of or near the computer. Turn the monitor and computer around so the backs are facing you.

2. There should be two cables provided with your monitor: the monitor cable (to connect it to the computer) and the power cable (to connect it to the power source). On most monitors, the monitor cable is permanently attached to the monitor. If your monitor does not have an attached cable, connect the cable to it now.

3. Examine the connector on the monitor cable and line it up with the Sport on the computer. Then insert the connector into the port.

> **Caution**
>
> To avoid damaging the connector, be careful not to bend the pins when you insert it.

4. If the connector has retaining screws, tighten them.

5. Plug the monitor's power cord into the power inlet on the back of the monitor.

6. Plug the other end of the power cord into a grounded electrical outlet or into the power outlet on the back of the computer.

Caution
Before you plug the monitor's power cord into the back of your computer, make sure the monitor's power requirements do not exceed 1 Amp.

Connecting a Printer or Other Device

Your computer has one bidirectional parallel and two serial ports. To connect a printer or other peripheral device, follow the appropriate instructions below.

Using the parallel port

Follow these steps to connect a parallel printer:

1. Place the printer next to the computer so that the backs are facing you.

2. Align the connector end of the printer cable with the PARALLELport and plug it in. If the connector has retaining screws, tighten them.

3. Connect the other end of the cable to the printer. To secure the cable, squeeze the clips at each side of the printer port and push them into place.

4. Plug the printer's power cord into a grounded electrical outlet.

Using the serial ports

If you have a printer, a modem, or a mouse with a serial interface, you can connect it to one of the serial (RS-232C) ports on the back of the computer. Make sure you have a cable compatible with a DB-9P connector.

To connect a serial device, insert the connector into one of the ports marked COM1 and COMC. If you are connecting only one serial device, use the COM1 port.

Connecting the Power Cord

Follow these steps to connect the computer's power cord:

1. Plug the power cord into the power inlet on the back of the computer.

   WARNING
   To avoid an electric shock, be sure to plug the cord into the computer before plugging it into the wall outlet.

   ---

2. Plug the other end of the power cord into a grounded electrical outlet.

Turning On the Computer

After you set up your system, you are ready to turn on the power. Use the illustration below to identify the features of your system's front panel. (Your computer's front panel may look a bit different from the one illustrated in this manual.)
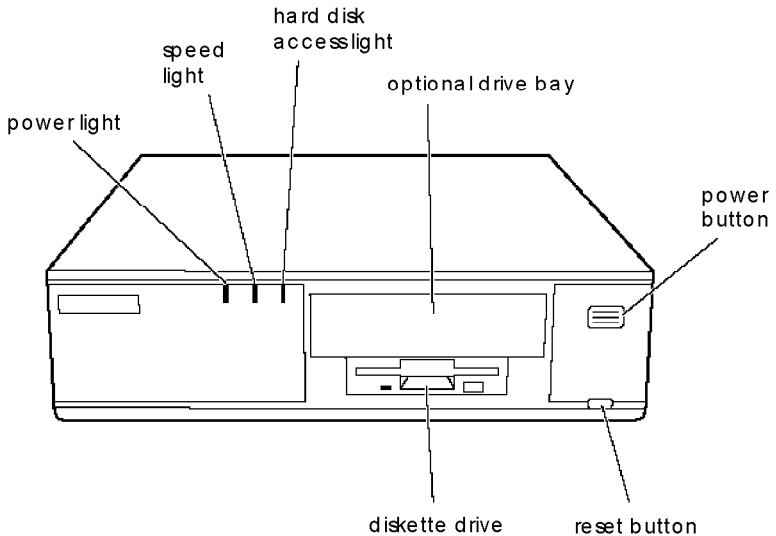
Before you turn on your computer, check the following safety rules to avoid accidentally damaging your computer or injuring yourself

☐ Do not connect or disconnect any peripheral device cables (including the keyboard or a mouse) or power cables unless the computer's power is off.

☐ Never turn off or reset your computer while a disk drive light is on. This can destroy data stored on the disk.

☐ Never turn on the computer with a protective card in the diskette drive.

☐ Always wait at least 20 seconds after you turn off the power before you turn it on again to prevent possible damage to the computer's electrical circuitry.

☐ Do not leave a beverage near your system. Spilled liquid can damage the circuitry of your equipment.

Follow these steps to turn on your system :

1. Turn your computer around so the front panel faces you. Place your monitor, printer, and other devices in a convenient arrangement.

2. If there is a protective card in the diskette drive, remove it.

3. Turn on the monitor, printer, and any other devices connected to the computer.

4. Turn on the computer by pressing the power button on the right side of the front panel.

   The power indicator lights up, then the screen displays the BIOS version number and copyright information. The computer performs its power-on diagnostics, which are a series of checks that make sure everything is working correctly. During diagnostics, you see a screen message telling you to press F2 to run the SETUP program. (Chapter 2 describes starting and using SETUP.)

   When the computer completes its testing, it displays a screen describing the system's configuration. If necessary, press the Pause key on the keyboard to view the configuration screen. Then press any key to continue the startup process.

5. If necessary, use the controls on your monitor to adjust the brightness and contrast until you can easily see the characters on the screen. If your monitor has horizontal and vertical hold controls, you may need to use them to stabilize the display.

If your system is configured to automatically load a program (such as Microsoft Windows or a word processing program), you see the first menu or screen display of that program. If not, you may see the operating system prompt, such as *C:* \> or A: \>.

If there is no operating system installed on your computer, you see an error message. Ignore the message for now; once you install the operating system, you will not see it.

Now you need to run the SETUP program to make sure your computer is configured properly. First turn off the computer, as described below, then see Chapter 2 for instructions. When you finish running SETUP, be sure to see "Post-SETUP Procedures" on page 2-13 for guidelines on what you need to do next.

Turning Off the Computer

Whenever you turn off your system, follow these steps:

1. Save your data and exit any application program you are using.

2. Check the hard disk drive light and the diskette drive light(s) to make sure they are not on. Do not turn off the computer if a drive light is on, because you can damage the drive or lose data.

3. Remove any diskette(s) from the diskette drive(s).

4. Press the power button to turn off the computer.

5. Turn off the monitor, printer, and any other peripheral devices.

Chapter 2

Running the SETUP Program

You may need to run the SETUP program the first time you use your computer. If your system came unconfigured, you need to define how it is set up. If your system was configured for you, you may want to check the settings or adjust the date and time. You also may need to run the program again later if you change your configuration.

SETUP lets you verify or change the following:

☐ System settings such as date, time, diskette drive type(s): and video display type

☐ Automatic or manual selection of hard disk drive(s)

☐ Automatic or manual selection of advanced hardware features for optimizing system performance

☐ System booting options

☐ Password security and anti-virus features.

SETUP also allows you to see summary information about your system.

The SETUP program and the factory default settings are stored in the computer's ROM BIOS (read-only memory, basic input/ output system). The configuration information you enter is stored in an area of memory called CMOS RAM. This memory is backed up by a battery, so it is not erased when you turn off or reset the computer.

Starting the SETUP Program

When you start your computer, it performs some power-on diagnostics. During these diagnostics, you may see the following message:

Press <F2> to enter SETUP

(In SETUP, you can disable this message, if desired.)

Press F2 to run SETUP. This message is only on the screen for a few seconds. If you missed it, restart the computer and try again.

If the system detects an error in your configuration, you hear two beeps and see an error message followed by this message:

Press <Fl> to resume, <F2> to Setup

Press F2 to run SETUP.

SETUP displays the Main Menu. From this menu, you can select the various options to identify your system's configuration and then save your new values to CMOS. If you change your mind, you can cancel any changes you have made and restore the default values stored in ROM or load the values previously stored in CMOS.

The table below lists the keys you can use to perform SETUP operations.

SETUP function keys

Key	Function
↑↓ ← →	Move the cursor to the next or previous modifiable option
Home End	Move the cursor to the top or bottom of the menu
F1 or Alt H	Displays a help screen describing the option currently selected

SETUP function keys (continued)

Key	Function
F5 or –	Selects the previous value
F6 or + or Spacebar	Selects the next value
F9	Loads the factory default values for the SETUP options on the current screen
F10	Ignores any changes you have made on the current screen
Enter	Selects the current option or value
Esc or Alt X	Returns to the previous screen

Whenever you are in SETUP, the bottom of the screen lists the keys you can press to perform specific functions.

The System Setup Option

When you select this option, you see the System Setup screen. From this screen, you can set the system time and date, define your video display type, check system memory, and define the diskette drives.

Setting the Time and Date

The real-time clock in your computer continuously tracks the date and time-even when the computer is turned off. Once you set the System Time and System Date options, you should not need to change them, unless you adjust the time for daylight savings or a different time zone. (The computer automatically changes the date for leap years.)

Setting the Video Display Type

The Video System option allows you to define the type of display you are using. If you have a VGA monitor that you connected to the computer's built-in VGA port, select EGA/VGA.

If you connected a monitor that doesn't support VGA to a video adapter card installed in your system, select either the CGA 80 X 25 or the Monochrome option. If you installed a video adapter card, make sure you disabled the onboard VGA controller by setting jumper 518 to the Off position. (See Chapter 4 for instructions.)

Checking System Memory

Your computer comes with 4MB of RAM on a SIMM. MS-DOS and application programs that run under MS-DOS use the first 640KB of memory. The memory above 1MB is extended memory.

When you boot your system, the system BIOS detects the total memory size automatically. You see the memory configuration displayed in the System Memory and Extended Memory fields on this SETUP screen.

You cannot change these values; if they are not what you expect them to be, check that the SIMM(s) are securely seated in their sockets. (See Chapter 4 to locate the SIMM sockets.)

Setting the Diskette Drive(s)

On your system, diskette drive A is the 3.5-inch high-density drive installed in the lower drive bay. You may also have another drive of a different size or capacity; this is drive B. Check the settings for both drives and correct them if necessary.

The Fixed Disk Setup Option

The Fixed Disk Setup options define the types of hard disk drives you installed in your system. When you select this option, you see the Fixed Disk Setup screen. From this screen, select Fixed Disk 0 Controlor Fixed Disk 1 Control.

Your computer comes with a hard disk auto-sensing feature. Press **Enter** when the Autotype Fixed Disk option is highlighted. The system detects the type of hard disk drive and fills in the remaining fields on the screen.

If you are using an older drive or a preformatted drive, it may not support the auto-sensing feature. If you press **Enter** when the Autotype Fixed Diskoption ishighlighted and the drive parameters do not match your drive, check Appendix A to see if your drive's parameters are included in the hard disk drive table. If not, you need to define your own drive type or reformat the disk. See the next section for instructions on how to define your own drive type.

Defining Your Own Drive Type

If the parameters for your hard disk do not match the parameters detected by the auto-sensing feature, or if you want to use your drive with parameters other than the defaults, you can define your own type. (See Appendix A for a list of predefined hard disk drive types and their parameters.)

To define your own drive type, follow these steps:

1. Move the cursor to Type and select User.

2. Type the values in each field that are appropriate for your hard disk drive.

3. When you exit SETUP, make sure you save your changes.

The Advanced System Setup Option

When you select this option from the Main Menu, you see the Advanced System Setup screen. From this screen, you can select options that allow you to configure the computer's cache memory and shadow memory, and define the advanced chipset options.

> **Note**
> Your system can automatically configure the Advanced System Setup options for you. To avoid configuration problems, you should let the system configure these options.

Configuring Cache Memory

The system can configure your Memory Cache options or you can manually set them. If you installed external cache, enabling cache memory improves system performance, especially in large data retrieval and processing environments.

If you choose to configure the cache memory yourself (rather than let the system configure it for you), you can define the write and burst wait states and two non-cacheable areas of memory. However, it's a good idea to let the system automatically configure these features.

Configuring Memory Shadow

The system can configure the Memory Shadow options or you can manually set them. You can enable or disable shadowing of your system and video memory and control the specific blocks of ROM used for this purpose.

Your computer can access RAM faster than ROM. The options on this screen allow your system to copy the contents of its system and/ or video ROM into RAM. When you use shadowing, your system can perform certain operations faster, providing a significant increase in performance.

Note

For the best system performance, always set the System shadow and the Video shadow options to Enabled.

If you enable shadowing for specific blocks, the ROM located in these blocks is copied to the shadow area.

Configuring Chipset Registers

The system can set your Advanced Chipset Control options or you can manually change the values in the chipset registers. Setting these values correctly increases your system performance; however, setting them incorrectly may cause your system to malfunction or shut down. Be sure to set the Auto Configuration option to Enabled to let the system automatically configure these options to avoid problems.

Setting the Boot Options

When you select Boot Options from the Main Menu, you see the Boot Options screen. These options allow you to define the boot sequence and determine the information you see on the screen when you start up your system.

The Disk drive boot sequence option determines the order in which the computer checks the drives when it looks for the operating system.

If you select A: then C:, each time you turn on the computer, it first tries to load the operating system from drive A. If drive A doesn't contain an operating system, the computer loads it from drive C. If you select C : then A:, the computer tries to load the operating system from drive C first. If drive C doesn't contain an operating system, the computer tries to load it from drive A. If you select C : only, the computer tries to load the operating system from drive C only.

If you set the Disk drive boot sequence option to C: only, you can disable the Floppy seek option so the system does not try to access the diskette drive at startup. Disabling the Floppy seek option decreases the time needed to boot the system.

The Display SETUP prompt during POST option allows you to disable the message Press <F2> to enter SETUP that you see during power-on diagnostics. You may want to disable this prompt to prevent unauthorized users from seeing the SETUP prompt. Even when the message is disabled, however, you can still start SETUP by pressing F2 within the allowed amount of time.

The Pause on POST errors option allows you to disable the error message and the message Press <Al> to resume, <F2> to Setup that you see when the system identifies a configuration error. If you disable this option, the system ignores configuration errors it finds during power-on diagnostics and starts as it normally would. It's a good idea to keep this option enabled.

By disabling the System summary screen at boot option, you can disable the system summary screen that you see when you start the system. If you disable this option, your system starts up faster. You can see the same screen by selecting the System Summary option from the Main Menu. (See page 2-12.)

The System Security and Anti-Virus Options

When you select the Security and Anti-Virus option from the Main Menu, you see the System Security and Anti-Virus screen. The password options on this screen let you define both a Supervisor and a User password. You can specify whether a password is required when you start the system.

The Diskette Access option allows you to restrict diskette access at either the User or Supervisor password level to protect your system from receiving a virus from a diskette.

Entering or changing a Password

You can define both User and Supervisor password levels for this system. If the system will be used by more than one person, you may want to set a Supervisor password for yourself and a User password for others you don't want to have complete access to the system. For instance, you may want to restrict access to the diskette drives or the computer's virus protection features.

If you enable the Password on boot option, you must enter the Supervisor or User password each time you turn on the system. If you do not enable this option but you have defined passwords, you must enter the password each time you start the SETUP program. If both a Supervisor and User password are enabled, SETUP displays options for setting the User password only for users who logged on with a user password.

To specify a User password, you must first specify a Supervisor password, follow these steps to enter or change a Supervisor password:

1. Select the Set Supervisor Password option and press Enter.

2. You see a Set Supervisor Password window. Type the password you want to use, then press Enter. You can define a password of up to eight characters.

3. Type the same password a second time and press Enter. You see a message that your changes have been saved.

4. Press the spacebar. The Supervisor Password IS option is now set to Enabled.

To set a User password, select the Set User Password option and follow the steps above.

Deleting Passwords

To delete your passwords, follow these steps:

1. Set the Password on boot option to Disabled.

2. Delete the User password by pressing Enter for both the password field and the confirmation field. Don't type any characters in these fields.

3. Then delete the Supervisor password the same way.

> **Note**
> You must delete the User password before SETUP will allow you to access the Supervisor password.

If you have forgotten your password(s), see "Password Problems" in Chapter 6.

Using the Diskette Access Option

The Diskette Access option allows you to restrict access to your diskette drives based on the password levels you have defined. This prevents unauthorized users from accessing the drives and possibly introducing a virus into your system. You can restrict access only if passwords are enabled and you have enabled the Password on boot option.

If you select Supervisor for this option you can access the diskette drives only if you enter the Supervisor password during system startup. Someone who starts the system with a User password, however, will see an error message when he or she tries to access the diskette drive. If you select User for the Diskette Access option, you can access the diskette drives whether you enter the Supervisor or User password during startup.

> **Note**
> To use passwords for diskette drive access, you must enable the Password on boot option. If you select a password level for Diskette Access, but leave the Password on boot option disabled, you see an error message whenever you try to access your diskette drive.

The System Summary Option

When you select the System Summary option from the Main Menu, the SETUP program displays a summary of the configuration settings for your system.

This is the same screen you see during system startup. You can choose not to have the system display this screen so system startup is faster. See page 2-8 for information on disabling this option.

Exiting SETUP

When you leave SETUP, you can save your settings, or exit SETUP without saving your settings. You can also return all values to the factory defaults.

To leave SETUP, press ESC from any SETUP screen. From the Main Menu, you can do the following:

Load ROM Default Values — Loads the factory default settings **stored in ROM back into CMOS. If you change your system configuration and then have problems, you can load the ROM values to boot the system and start over.**

Load Values from CMOS — Loads the current values stored in CMOS for all SETUP options. This ignores any changes you have made using SETUP.

Save Values to CMOS — Saves the changes you have made to your configuration to CMOS.

Press ESC to leave SETUP and restart your computer.

Post-SETUP Procedures

After you run SETUP for the first time, you may need to install the operating system on your computer (if it is not already installed). See your operating system manual for instructions.

Once you have installed your operating system, install any software you plan to use. See your application program manuals for instructions.

You may also want to install the optional extended video drivers for some of your application programs. (If your computer was configured for you, these drivers are already installed.) See the README file included on your Utility diskette for more information.

Note

If you plan to install video drivers for Windows applications, you must install Windows before you install the drivers.

Chapter 3
Using Your Computer

This chapter briefly describes the following operations:

☐ Working comfortably

☐ Inserting and removing diskettes

☐ Stopping a command or program

☐ Resetting the computer

☐ Using the password

☐ Changing the processor speed.

Working Comfortably

Use the guidelines to create a comfortable work environment:

☐ Use good posture. Keep your elbows, hips, and knees bent at approximately 90 degree angles and keep your wrists as close to horizontal as possible.

☐ Vary your posture often and take frequent breaks. Stand up, stretch, and move around.

☐ Use a good chair. Make sure your chair supports your lower back. Padded armrests let you rest your arms as you work.

☐ If you use a copy stand, keep it at the same eye level as your screen. This reduces eye and neck strain. Also, rest your eyes occasionally by closing them or focusing on a fixed spot in the distance.

□ Place your monitor directly in front of you and sit about an arm's length away from it. The top of the screen should be slightly below your eye level so you look down at the screen. Position the monitor so that no light is reflected from the screen.

□ Use good lighting that isn't too bright. Try to keep bright light sources out of your field of vision when you are looking at the screen.

□ Be gentle with your keyboard. Too much force creates tension in your hands. Also, make sure your work surface has enough room for you to move the mouse or other pointing device freely.

Inserting and Removing Disks

To insert a diskette into a 3.5-inch drive, hold the diskette with the label facing up and the metal shutter leading into the drive, as shown in the following illustration. Slide the diskette into the drive until it clicks into place.
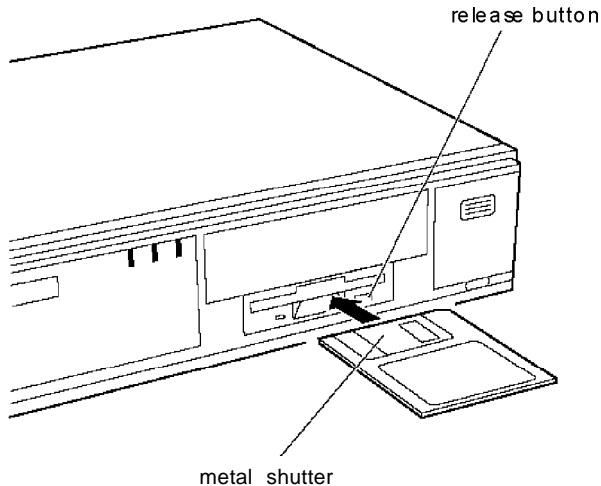
To insert a diskette into a 5.25-inch drive, hold the diskette with the label facing up and the read/ write slot leading into the drive. When the diskette is completely in the drive, turn down the latch to secure the diskette in the drive.

When you want to remove the diskette, make sure the drive light is off; then press the release button or turn the latch. Remove the diskette and store it properly.

Caution
Never remove a diskette, reset the computer, or turn it off while a diskette drive light is on. You could lose data. Also, remove all diskettes before you turn off the computer.

Sopping a Command or Program

You may sometimes need to stop a command or program while it is running. If you have entered a DOS or application program command that you want to stop, try one of the following:

☐ Press Pause

☐ Press Ctrl C

☐ Press Ctrl Break.

If these methods do not work, you may need to reset the computer as described below. Do not turn off the computer to exit a program or stop a command unless you have to, because the computer erases any data you did not save.

Resetting the Computer

Occasionally, you may want to clear the computer's memory
without turning it off. You can do this by resetting the
computer.

For example, if an error occurs and the computer does not
respond to your keyboard entries, you can reset it to reload
your operating system and try again. However, resetting erases
any data in memory that you have not saved; so reset only if
necessary.

Caution
Do not reset the computer to exit a program. Some programs
classify and store new data when you exit them. If you reset
the computer without properly exiting a program, you may
lose data.

When you reset the computer, the operating system must be
either on the hard disk or on a diskette in drive A; so if you do
not have a hard disk, insert the operating system diskette in
drive A. If you are using DOS, you can hold down Ctrl and Alt
and press Del.

If you set the Disk drive boot sequence option in SETUP
to C: only (see Chapter 2), the operating system must be on
the hard disk when you reset the computer. If you selected A:
then C: or C: then A:, the operating system must be either
on the hard disk or on a diskette in drive A. If you do not have
a hard disk, insert a bootable diskette (one that contains the
necessary portions of the operating system) in drive A. If you
are using MS-DOS, press Ctrl Alt and Del to reset the system.

You can also press the RESETbutton located on the front panel
of your computer. The screen displays nothing for a moment
and then the computer reloads the operating system.

If resetting the computer does not solve the problem, you need to turn it off and on again. Remove any diskette(s) from the diskette drive(s), turn off the computer, and wait 20 seconds. If you do not have a hard disk drive, insert a bootable diskette in drive A. Then turn on the computer.

Using a Password

In SETUP, you can define both a Supervisor level password and a User level password. You can also specify whether a password is required when you boot the system. This password can also control access to the diskette drives.

If `you enabled the Password on boot option in SETUP, you must enter the Supervisor or User password every time you turn on or reset the computer. If you entered a password but disabled the Password on boot option, you must enter the password when you start SETUP.

If you set the Diskette Access option to Supervisor, you can access a diskette drive only if you entered a Supervisor password when you started the system. If you entered a User password but the Diskette Access option is set to Supervisor, you see an error message when you cannot access the diskette drive.

When you enter your password, you'll see the prompt, Enter password:. As you type your password, you see a rectangle for each character you type. When you press Enter, the computer loads the operating system (or starts SETUP).

If you don't enter the correct password the first time you type it, you can try two more times. If you haven't entered the correct password on the third try, the computer locks up to prevent unauthorized access. You see the message:

    System Disabled!

You must turn off the computer and start over. You can reset the computer using the RESETbutton but you cannot reset the computer by pressing Ctrl Alt and Del.

Note

If you want to change or delete your password, you must run the SETUP program as described in Chapter 2.

If you do not remember your password, see "Password Problems" in Chapter 6.

Changing the Processor Speed

Your computer's processor can operate at two speeds: fast (the speed of your microprocessor) or slow (8 MHz). The slow speed is available to provide compatibility with older application programs.

When your computer is operating at fast speed, the speed light (labeled TURBO) on the front panel is on. When the computer is operating at slow speed, the light is off.

You should use fast speed for almost everything you do because your programs will work faster. However, certain application programs have specific timing requirements and can run only at the slower speed. See your software manual to determine if this is the case.

Some copy-protected programs require the computer to run at slow speed while accessing the program on a diskette. These programs also usually require you to leave a *key disk-the* diskette that contains the copy protection-in the diskette drive. If you use a copy-protected program, you can change the speed to slow to access the diskette and return it to fast speed when you are finished.

You can change the processor speed temporarily by entering one of the following commands from the numeric keypad on your keyboard :

☐ To select slow speed, press **Ctrl Alt** and then press the -key on the numeric keypad. This turns off the speed light.

☐ To select fast speed, press **Ctrl Alt** and press + on the numeric keypad. The speed light comes on.

Note

You can use the commands listed above while you are running a program. However, if the program uses one of these commands for another function, you cannot use it to change the processor speed.

The speed setting remains in effect until you one of do the following:

☐ Reset your computer

☐ Turn off your computer

☐ Change the speed with another keyboard command

☐ Change the jumper setting of J25 (as described in Chapter 4).

Chapter 4

Installing and Removing Options

You can enhance the performance of your computer by adding optional equipment such as system, video, or cache memory modules, option cards, or a microprocessor upgrade.

This chapter first describes how to remove your computer's cover to install options and how to replace the cover when you are finished. It then describes the following:

☐ Locating the internal components

☐ Changing the jumper settings

☐ Installing and removing SIMMs (single in line memory modules)

☐ Installing and removing option cards

☐ Removing and re-installing the option card connector board

☐ Adding video memory

☐ Installing external cache

☐ Installing microprocessor upgrades.

Caution
Never install options or change jumper settings when the computer is turned on or the power cable is connected to the computer.

Once you have installed your options, see "Post-installation Procedures" on page 4-30.
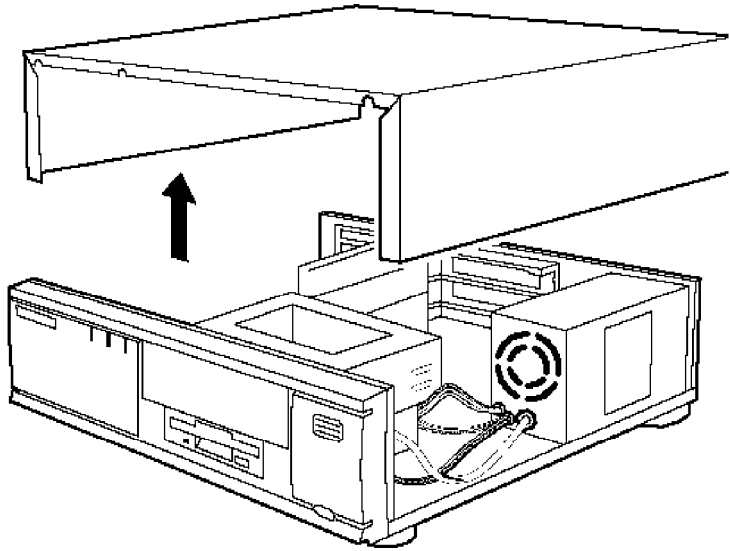
Removing the Cover

You need to remove the computer's cover to install any of the options described in this chapter or to install or remove a disk drive (as described in Chapter 5).

Follow these steps to remove the cover:

1. Turn off the computer and then any peripheral devices (including the monitor and printer).

2. Disconnect the computer's power cable from the electrical outlet and from the back panel. Also disconnect any cables that are connected to the computer, including the keyboard cable.

3. If the monitor is on top of the computer, lift it off and set it to one side.

4. Turn the computer around so the back panel is facing you.

5. Remove the three screws securing the back panel.
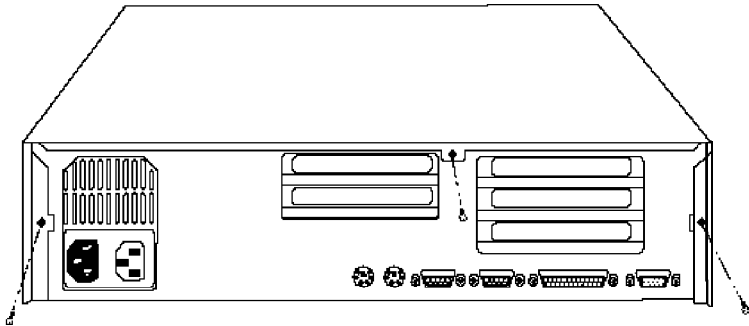
6. Grasp the sides of the cover and lift it straight up, as shown below:

7. Set the cover aside.

8. Ground yourself to the computer by touching the metal surface of the back panel.

WARNING

Be sure to ground yourself by touching the back panel of the computer every time you remove the cover. If you are not properly grounded, you could generate an electric shock that could damage a component when you touch it.
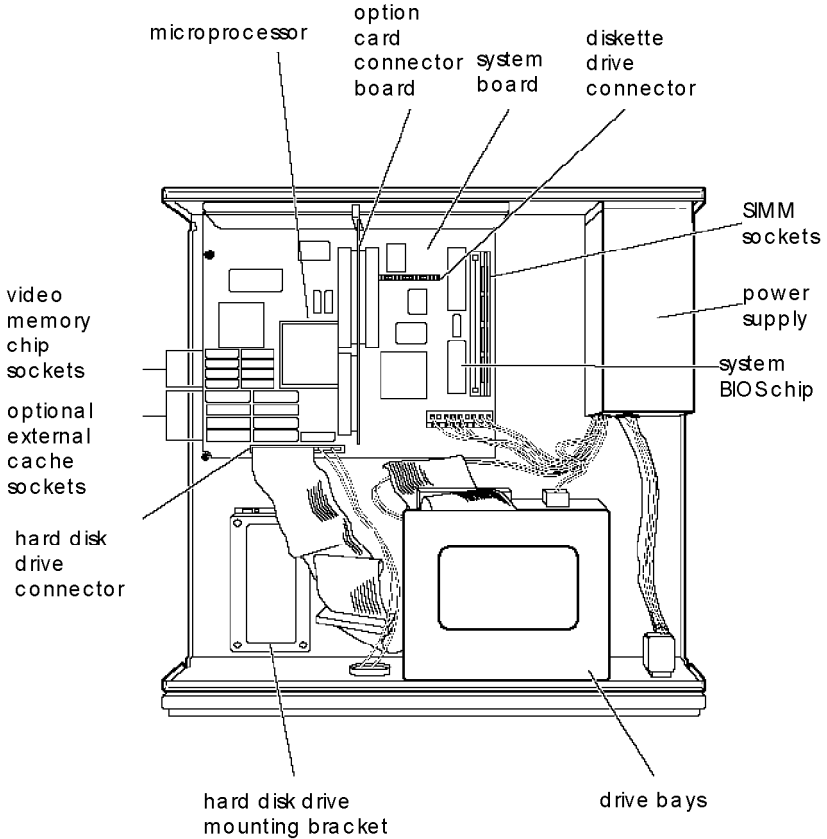

Replacing the Cover

When you are ready to replace the computer's cover, follow these steps:

1. Make sure all the internal components are installed properly.

2. Check all cable connections, especially those that might have been loosened during your work.

3. Make sure all cables are out of the way so they do not catch on the cover.

4. Insert the front of the cover between the front bezel and the chassis of the computer and guide it straight down. (See the illustration on page 4-3.)

5. Replace the three cover retaining screws.

6. Reconnect the computer to the monitor, printer, keyboard, and any other peripheral devices you have. Then reconnect the power cable to the back of the computer and to an electrical outlet.

Locating the Internal Components

As you follow the instructions in this chapter, refer to the illustration below to locate the different components inside your computer.

microprocessor

option card connector board

system board

diskette drive connector

SIMM sockets

video memory chip sockets

power supply

optional external cache sockets

system BIOS chip

hard disk drive connector

hard disk drive mounting bracket

drive bays

Changing the Jumper Settings

The main system board in your computer has a number of jumpers that control certain functions. These jumpers are preset at the factory to default positions. See the illustration below to locate the jumpers on the system board.
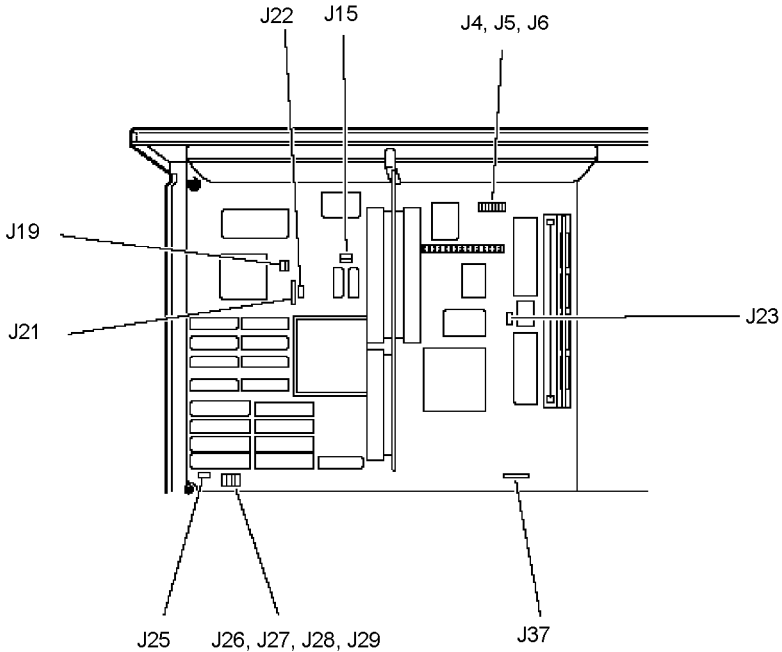
Note
These are the only jumpers you may need to change. Other jumpers on the system board are for service purposes only.

Use the information in the following tables to change jumper settings, if necessary.

Jumpersettings

Jumper number	Jumper setting	Function
J4	1-2 * 2-3	Assigns PARALLEL port as LPT1 Assigns PARALLEL port as LPT2
J5	1-2 * 2-3	Assigns COM1 serial port as COM1 Assigns COM1 serial port as COM3 **
J6	1-2 * 2-3	Assigns COM2 serial port as COM2 Assigns COM2 serial port as COM4 **
J13	1-2 * 2-3	Enables diskette drive controller Disables diskette drive controller
J15 ***	1-2 5-6	Selects a CPU clock speed of 33 MHz (486SX/33, 486DX33, 486DX2/66) Selects a CPU clock speed of 25 MHz (486SX/25, 486DX2/50)
J18	On * Off	Enables the onboard VGA Disables the onboard VGA
J23	1-2 * 2-3	Enables the IDE hard disk drive controller Disables the IDE hard disk drive controller
J25	Off * On	Selects turbo speed Selects 8 MHz speed
J37	2-3 * 3-4	Selects normal system board battery operation Discharges CMOS memory (this resets the SETUP values to their factory defaults)

* Factory setting

** You can use MS-DOS to automatically reassign parallel and serial ports. Check your MS-DOS manual for more information.

***Setting dependson CPU

Edema/cache jumper settings*

Cache size	J26	J27	J28	J29
64KB	Off	2-3	1-2	1-2
128KB	1-2	1-2	1-2	2-3
256KB	2-3	2-3	2-3	2-3

* If you have no external cache installed, the position of these jumpersdoes not matter.

Processor type jumper settings

Processor type	J21	J22
486DX/DX2	1-2, 3-4	1-2
486SX	2-3	Off

Setting the Jumpers

If you need to change any jumper settings, follow these steps:

1. Refer to the illustration on page 4-6 to locate the jumpers.

2. If there are any option cards installed in your computer, you need to remove them to access the jumpers. See page 4-18.

3. A jumper's setting is determined by where the jumper is placed on the pins. Use the following table to identify the pin settings for 2-pin, 3-pin, and 4-pin jumpers. To identify pin 1, look at the system board under the jumper. You will see a triangle traced on the board at pin 1.

Setting jumpers

Jumper type	Position			
2-pin	On	Off		
3-pin	1-2	2-3	Off	
4-pin	1-2	2-3	3-4	Off

To move a jumper from one position to the other, use needle-nose pliers or tweezers to pull it off its pins and gently move it to the desired position.

> **Caution**
> Be careful not to bend the jumper pins or damage any components on the main system board.

4. Replace any option cards you removed. See page 4-14 for instructions.

Installing Memory Modules (SMMs)

Your computer comes with 4MB of memory on a SIMM. By installing additional SIMMs, you can increase the amount of memory in your computer up to 64MB.

There are two SIMM sockets on the main system board. You can install 4MB, SMB, 16MB, and 32MB SIMMs. The following table shows the possible SIMM configurations; do not install memory in any other configuration. (When the front of the computer is facing you, BANK 0 is on the right. An x in the table below indicates no SIMM installed .)

3MM configurations

BANK 0	BANK 1	Total memory
4MB	x	4MB
4MB	4MB	8MB
4MB	8MB	12MB
8MB	x	8MB
8MB	4MB	12MB
8MB	8MB	16MB
16MB	x	16MB
16MB	4MB	20MB
16MB	8MB	24MB
16MB	16MB	32MB
16MB	32MB	48MB
32MB	x	32MB
32MB	4MB	36MB
32MB	8MB	40MB
32MB	16MB	48MB
32MB	32MB	64MB

Use only tin-plated, 32-bit or 36-bit, 72-pin, fast-page mode SIMMs that operate at an access speed of 70ns (nanoseconds) or faster.
Be sure all the SIMMs operate at the same speed.

Note
You can install 2MB SIMMs only if you install them in a pair (4MB total memory). You cannot install one 2MB SIMM with any other size SIMM.

Inserting SIMMs

Make sure the computer is turned off and then follow these steps to install SIMMs:

1. Make sure the front of the computer is facing you.

2. Refer to the illustration on page 4-5 to locate the SIMM sockets on the right side of the system board.

3. Remove any option cards that may be blocking your access to the SIMM sockets. (See page 4-18 for instructions.)

4. Position the SIMM at an angle over the empty SIMM socket, as shown below.

---
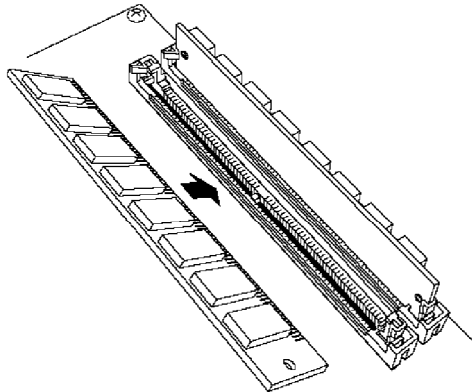
5. Push the SIMM into the socket until it is seated firmly in the slot. Then tilt it upright, as shown below, guiding the hole at each end of the SIMM over the retaining post at each end of the SIMM socket. If it does not go in smoothly, do not force it; pull it all the way out and try again.
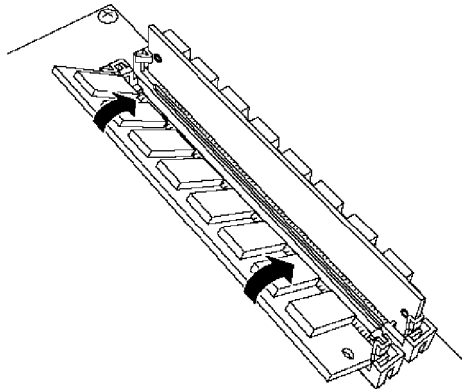
6. Replace any option cards you removed. (See page 4-14 for instructions.)

Removing SIMMs

If you need to remove SIMMs from your computer (to install different ones, for example), make sure the computer is turned off and then follow the steps below:

1. Make sure the front of the computer is facing you.

2. Refer to the illustration on page 4-5 to locate the SIMM sockets on the right side of the system board.

3. Remove any option cards that may be blocking your access to the SIMM sockets. (See page 4-18 for instructions.)

4. Use your fingers or a small screwdriver to carefully pull away the metal tabs that secure the SIMM at each end, as shown below.
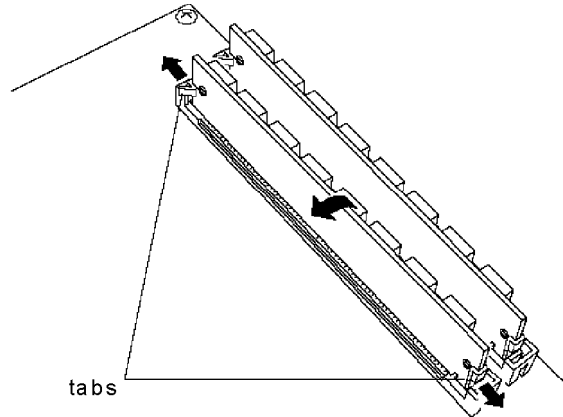
tabs

5. As you pull away the tabs, the SIMM falls to the side. Remove it from the socket.

6. If necessary, follow the same procedure to remove the other SIMM.

7. If you are inserting different SIMMs, follow the instructions on page 4-ll to install them.

8. Replace any option cards you removed, as described below.

Installing an Option Card

This section explains how to install option cards in your computer. Your computer has three 16-bit, full-length slots and two S-bit, half-length slots to accommodate a total of five option cards.

As you install option cards, keep these guidelines in mind:

☐ Usually it does not matter which slot an option card occupies as long as the card fits in the slot. For example, you can place some S-bit cards in a 16-bit slot. When you select the slot you want to use, make sure that no components are touching or obstructing other cards or cables.

☐ If you have a DX or DX2 processor installed, you may not be able to install a 16-bit card in the bottom slot because a heat sink or heat sink/ fan assembly may be mounted on the processor.

☐ When you unpack the option card, be careful not to touch any of the components on the circuit board or the gold-edged connectors. If you need to set it down before you install it, place it gently on top of its original packing materials with the component side facing up. Keep the packing materials in case you remove the card later.

☐ Before you install the card, adjust any switches or jumpers on it, if necessary. (See your option card documentation for instructions.) Also, see if you need to change any jumper settings on the system board. For example, if you install a SCSI hard disk drive, you may need to change jumper 523 to disable the IDE hard disk drive controller. See page 4-6 for more information on jumpers.

Caution

Make sure the power requirements for the option cards you install do not exceed the power supply limitations. See your option card manual(s) for the power requirements. Then check Appendix A for the option slot power limits.

Refer to the illustrations below and follow these steps to install an option card:

1. If you are using a 16-bit option slot, go on to step 2. If you are using an S-bit slot near the power supply, you need to move the power supply before you can remove the metal slot cover.

    Remove the screws securing the power supply to the computer, as shown below. Be careful not to disconnect any of the cables. Slide the power supply away from the option slots until you can remove the slot covers easily.
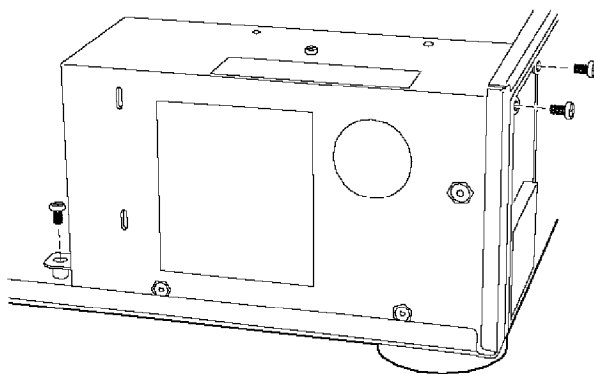
2. Remove the retaining screw securing the option slot cover to the computer, as shown below. (Keep the screw to secure the option card to the computer.)
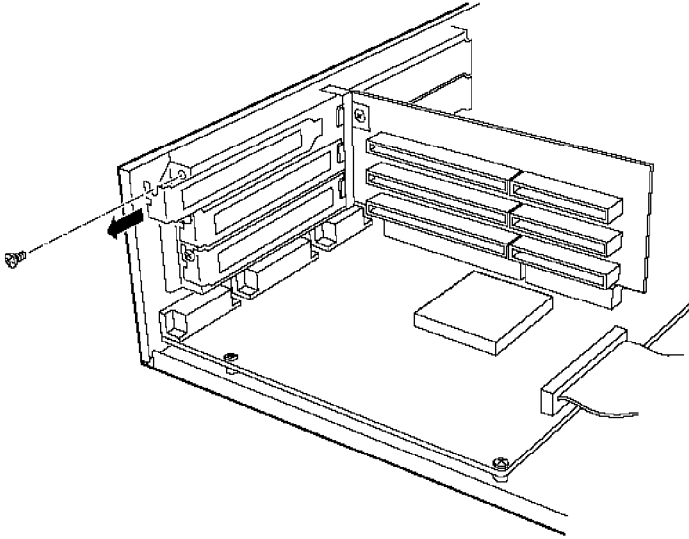
3. Slide out the slot cover and set it aside. (Store it in a safe place in case you remove the option card later.)

4. Hold the card along the top corners and guide it into the connector, as shown below. (If you are installing a full-length card, insert the front edge of the card into the corresponding guide inside the computer's front panel.)
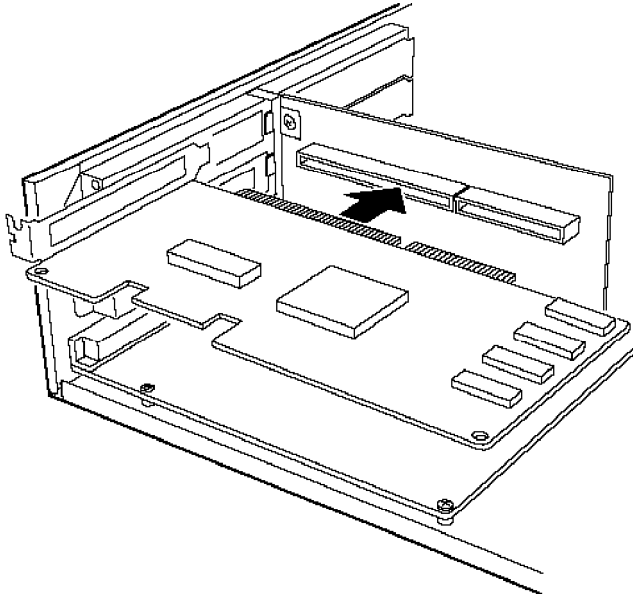
Once the connectors reach the slot, push the card in firmly (but carefully) to insert it fully. You should feel the card fit into place. If it does not go in smoothly, do not force it; pull the card all the way out and try again.

5. Secure the end of the card to the computer with the retaining screw.

6. If you removed the power supply, make sure you replace it again, as outlined in step 1.

Removing an Option Card

You may need to remove an option card to access components on the main system board-to change a jumper setting, for example. You may also want to remove a card if you no longer need it. Refer to the option card illustration on page 4-17 and follow these steps:

1. Remove the retaining screw securing the option card to the computer. Then pull the card straight out of the slot.

2. Set the card aside with the component side facing up.

3. If you are not replacing an option card, replace the option slot cover and retaining screw.

Removing the Option Card Connector Board

You may need to remove the option card connector board to replace the microprocessor installed on your system board. Follow these steps:

1. Remove any option cards from the connector board (see the section above).

2. Remove the two retaining screws securing the option card connector board to the back of the computer, as shown below.
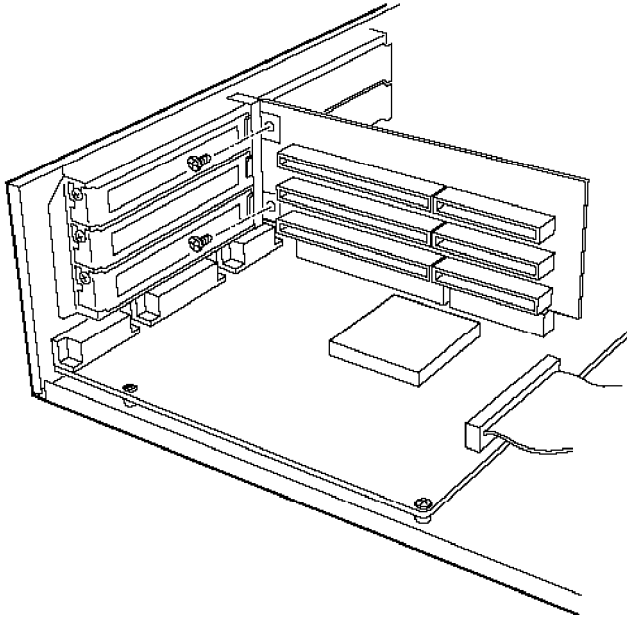
3. Pull the board straight up and out of its socket and set it aside.

Replacing the Option Card Connector Board

If you removed the option card connector board, follow these steps to replace it. Refer to the option card connector board illustration above.

1. Position the board above its slot and push it straight into the connector, as shown below.
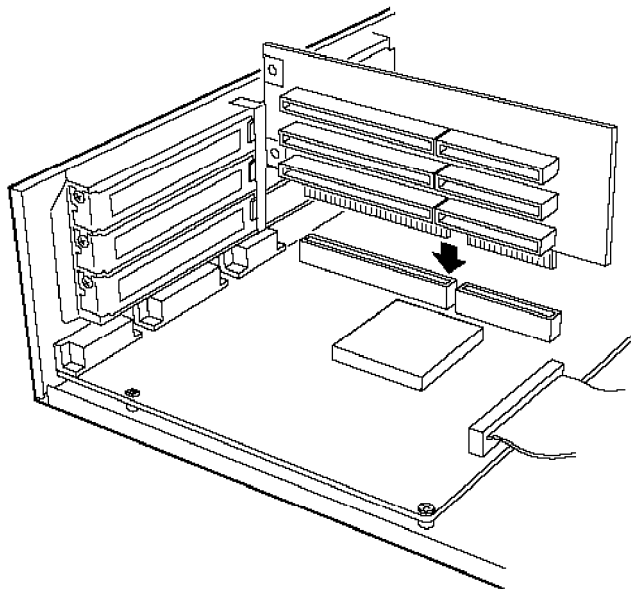
2. Secure the board to the back of the computer with its two retaining screws.

3. Re-install any option cards you removed. See page 4-14.

Adding Video Memory

Your computer comes with 512KB of video memory soldered onto the main system board. You can increase your video memory to 1MB by installing four video DRAM, 20-pin, 70ns or Sons, 256KB x 4-bit, DIP (Dual Inline Package) chips. This is useful for running graphics-intensive applications or for supporting resolutions up to 1024 x 768 in 256 colors.

For the memory to work properly, you must install chips in one of the following configurations (each bank consists of two video memory sockets).

Video memory chip configuration

Bank 0 U14 and U15	Bank 1 U19 and U20	Bank 2 U21 and U22	Bank 3 U26 and U27	Total memory
Soldered	Filled			512KB *
Soldered	Filled	Filled	Filled	1024KB

* Standard video memory

Installing the Video Chips

Follow these steps to install additional video DIP chips:

1. Locate the memory chip sockets on the main system board, shown on page 4-5.

   Bank 0 contains two chips soldered onto the main system board, so you cannot add video memory in this bank. Bank 1 contains the two filled sockets closest to the soldered chips. Bank 2 is the two middle sockets and Bank 3 consists of the remaining two sockets.

2. If there an option card in your way, remove it. See page 4-18 for instructions.

Caution

To avoid generating static electricity and damaging the memory chips, ground yourself by touching the metal surface on the inside of the computer's back panel. Then remain as stationary as possible while you install them.

3. Remove the memory chips from their package and inspect each one. The pins should point inward at slightly less than a 90° angle.

    If any of the pins are bent, straighten them gently with your fingers or with small tweezers to align them with the other pins. Be careful when you do this; the pins are fragile and can break off easily.

4. Position one of the video chips over the first empty socket as shown below, aligning the pins on the chip with the holes in the socket. Make sure the notch in the end of the chip is aligned with a similar notch in the socket.
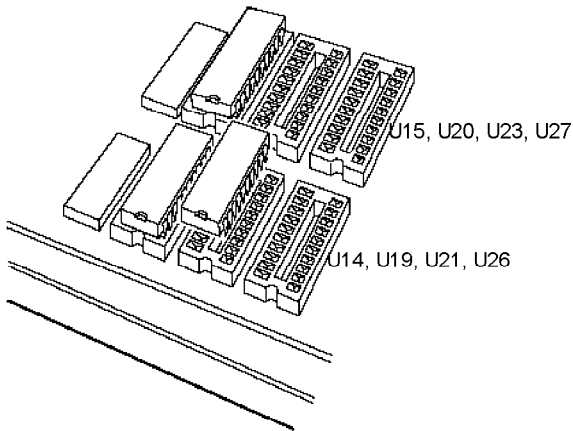
U15, U20, U23, U27

U14, U19, U21, U26

5. Gently press the chip halfway into the socket (to make sure it is correctly aligned). If the chip goes in at an angle, remove it with a chip puller or a small flat-head screwdriver and try again.

6. When the chip is properly positioned, push down firmly on both ends of the chip to make sure it is well-seated.

7. Repeat steps 4 through 6 for each of the remaining chips.

8. Replace any option cards you removed. See page 4-14 for instructions.

When you start your computer, it displays the video memory briefly before it begins its memory test.

Installing External Cache

You can install 64Kl3,128KB, or 256KB of external cache on your system.

☐   To install 64KB of external cache, use eight SRAM, 28-pin, 8K x 8,20ns DIP chips, and one 8K x 8,20ns tag chip

☐   To install 128KB of external cache, use four SRAM, 28-pin, 32K x 8,20ns DIP chips, and one 32K x 8,20ns tag chip

☐   To install 256KB of external cache, use eight SRAM, 28-pin, 32K x 8,20ns DIP chips, and one 32K x 8,20ns tag chip.

For the cache memory to work properly, you must install chips in the following configuration (each bank contains four cache memory sockets).

Cache memory configurations

BANK 0 U29, 32, 34, 36	BANK 1 U28, 31, 33, 35	Tag SRAM U37	Total cache
8K × 8	8K × 8	8K × 8	64KB
32K × 8	x	32K × 8	128KB
32K × 8	32K × 8	32K × 8	256KB

Installing the Cache Chips

Follow these steps:

1. Locate the external cache memory sockets on the main system board, shown on page 4-5.

2. If there is an option card in your way, remove it. See page 4-18 for instructions.

> **Caution**
> To avoid generating static electricity and damaging the cache chips, ground yourself by touching the metal surface on the inside of the computer's back panel. Then remain as stationary as possible while you install them.

3. Remove the cache chips from their package and inspect them. The pins should point inward at slightly less than a 90° angle.

   If any of the pins are bent or crooked, straighten them gently with your fingers or with small tweezers to align them with the other pins. Be careful when you do this; the pins are fragile and can break off easily.

4. Position one of the cache chips over the first socket as shown below, aligning the pins on the chip with the holes in the socket. Make sure the small notch on the end of the chip is aligned with the corresponding notch on the socket.
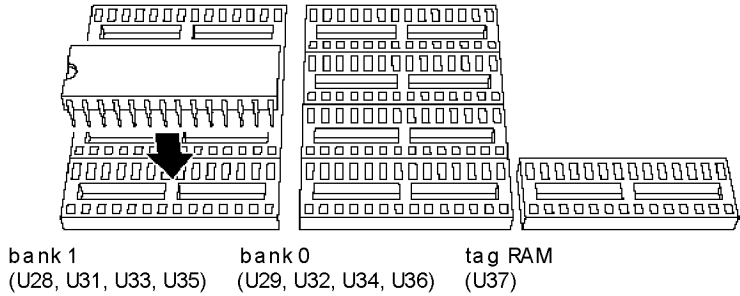
bank 1   bank 0   tag RAM
(U28, U31, U33, U35)   (U29, U32, U34, U36)   (U37)

5. Gently press the chip halfway into the socket (to make sure it is correctly aligned). If the chip goes in at an angle, remove it and try again.

6. When the chip is properly positioned, push down firmly on both ends of the chip to make sure it is well-seated.

7 Repeat steps 4 through 6 for each of the remaining chips.

8 Change jumpers 526,527,528, and J29 as described on page 4-8, to correspond to the amount of cache you installed.

9 Replace any option cards you removed. See page 4-14 for instructions.

10. Run SETUP to enable the External Cache option and check that the System shadow and Video shadow options are enabled. You select these options from the Advanced System Setup menu. Make sure you save your settings as you leave SETUP (see Chapter 2).

When the computer restarts, it displays the amount of external cache you have installed on the system.

Upgrading the Microprocessor

You can upgrade your computer by replacing the microprocessor with a faster one. The following table lists the components you can use to upgrade the microprocessor in your system.

Microprocessor upgrade components

Part	Manufacturer
486SX/33 processor	Intel
486DX/33 processor	Intel
486DX2/50 processor	Intel
486DX2/66 processor	Intel
Heat sink *	Tennmax Trading Corp.
Heat sink with fan **	Tennmax Trading Corp.

* For the DX/33 processor

** For the DX2150 and DX2166 processors

Use the following table to identify the general steps you need to perform to upgrade your microprocessor. Then see the page listed in the final column for instructions on performing those steps.

Microprocessor upgrade steps

If you install	You need to	See page
486SX/33	Remove the option card connector board	4-18
	Remove the existing processor chip	4-27
	Install the 486SX/33 chip	4-27
	Change jumper J15 (if necesary)	4-6
	Replace the option card connector board	4-20
486DX/33 486DX2/50 486DX2/66	Remove the option card connector board	4-18
	Remove the existing processor chip	4-27
	Install the new chip	4-27
	Change jumpers J21, J22, and J15	4-6
	Replace the option card connector board	4-20

Replacing the Processor Chip

Be sure to remove the option card connector board before you follow the steps below to replace your microprocessor; see page 4-18 for instructions.

1. Use the illustration on page 4-5 to locate the microprocessor.

2. Ground yourself by touching the metal surface on the inside of the computer's back panel.

Caution
Make sure you ground yourself before you touch the processor chip. Then remain as stationary as possible while you install it. Do not touch the pins on the processor chip. Handle the microprocessor only by the edges of its case.

---

3. If you use a chip puller, position the puller between the
    processor chip and the socket.

    You can also use a small, flat-edged screwdriver instead of a
    chip puller. Carefully wedge the tip of the screwdriver
    between the processor chip and the socket. Gently turn the
    screwdriver until the chip begins to separate from the
    socket. Move the screwdriver to another side of the
    processor chip and again turn it until the chip separates
    from the socket. Keep doing this until you can lift the
    processor chip straight up from the socket.

    Caution
    The 486SW 25 microprocessor may be soldered onto an
    adapter board that is seated in the microprocessor
    socket. Make sure you position your chip puller or
    screwdriver just above the socket to avoid damaging the
    adapter board.

    ---

4. Gently pull the processor chip straight up and set it aside.

5. Remove the replacement chip from its package and inspect
    the pins. If they are bent, do not install the processor chip.
    Contact your vendor for a new microprocessor.

6. Position the processor chip over the socket, aligning the notched edge of the chip (marked with a dot) with pin 1 on the socket, as shown below. A corresponding notch is drawn on the circuit board under the socket.

dot

pin 1
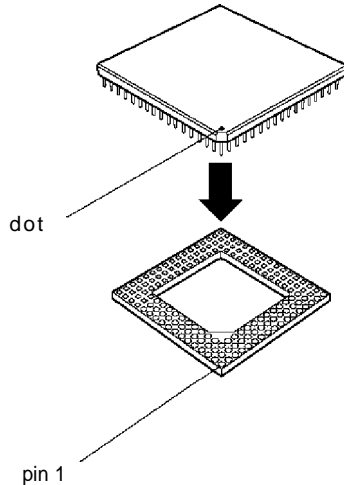
7. Make sure the pins in the processor chip are directly over the holes in the socket. Then gently push the microprocessor straight into the socket, pressing evenly on all sides.

8. If you are upgrading from a 486SX processor to a DX or DX2 processor, you need to change the jumper settings of 521 and 522. If you are upgrading to a CPU with a different clock speed, you may need to change the setting of jumper J15. See the tables on pages 4-7 and 4-8 for the correct jumper settings.

9. If you are upgrading to a DX or DX2 processor, you must install a heat sink or heat sink/ fan assembly. Follow the instructions included with the heat sink.

10 See page 4-20 for instructions on replacing the option card connector board. Then replace your option cards.

post-installation Procedures

After you install or remove options such as memory modules
or a microprocessor, you must run SETUP to update the
computer's configuration. See Chapter 2 for instructions.
Additionally, you may need to add some commands to your
configuration files. See your operating system manual and the
manual that came with your optional equipment.

Chapter 5
Installing and Removing Drives

This chapter describes how to install and remove optional drives in your computer. You can use these instructions to install a variety of devices, including hard disk drives, a diskette drive, a tape drive, a CD-ROM drive, or an optical drive. Although your drive may look different from the ones illustrated here, you should be able to install it the same way.

Your computer can hold up to four mass storage devices. You can install one or two hard disk drives using the internal hard disk drive mounting bracket. In the upper externally accessible bay, you can install a second diskette drive, a tape drive, a CD-ROM drive, or an optical drive.

To install or remove a drive, first remove the computer's cover as described in Chapter 4. Then follow the appropriate instructions in this chapter to install and remove drives:

☐ Installing a hard disk drive in the internal drive bay

☐ Removing a hard disk drive from the internal drive bay

☐ Installing a drive in the upper externally accessible drive bay

☐ Removing a drive from the upper drive bay

☐ Reconnecting drive and power cables to the diskette drive in the lower drive bay

☐ Post-installation procedures.

Some of the steps in this chapter may not apply for the drive you are installing. See the documentation that came with your drive for more information.

Installing a Hard Disk Drive in the Internal Drive Bay

Your computer may have a hard disk drive already installed in the internal drive bay. If not, you can install a l-inch high by 31/2-inch wide drive in this bay.

This section includes steps for the following procedures:

☐ Removing the mounting frames from the hard disk drive (if necessary)

☐ Connecting the hard disk drive cables

☐ Installing the hard disk drive under the mounting bracket

☐ Installing the hard disk drive above the mounting bracket.

Note

Be sure to check the jumper settings on the hard disk drive before you install it. Also, you may want to know the number of cylinders, heads, sectors, etc., if the auto-sensing feature in SETUP cannot correctly identify your drive. See Chapter 2 and the documentation that came with your drive for this information.

Before you can install a hard disk drive, you need to remove any option cards that may be blocking your access to the hard disk drive area. Once you have installed the drive, replace any option cards you removed. See Chapter 4 for instructions.

Removing the Mounting Fames

If there are mounting frames attached to your hard disk drive, you need to remove them before you can install the drive. Follow these steps:

1. On your drive, there may be a plastic guiderail and metal grounding plate attached to one of the mounting frames. If so, remove the screws securing them to the mounting frame and remove the guiderail and grounding plate.

plastic guiderail

metal grounding plate
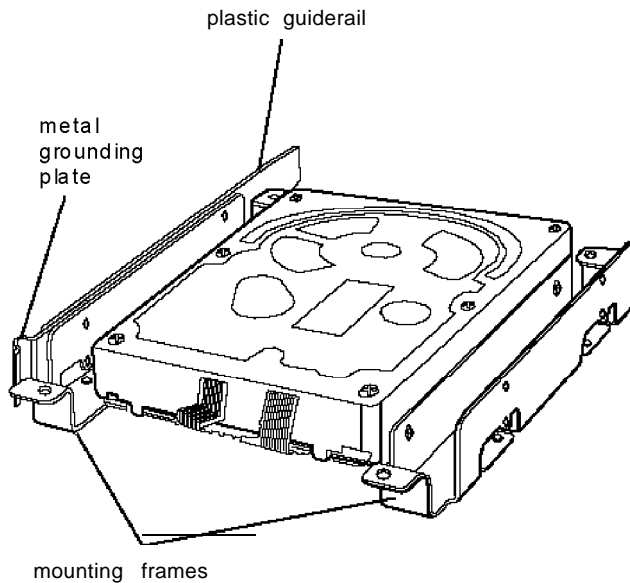
mounting frames

2. Then remove the two screws securing each mounting frame to the drive and remove the frames.

Connecting the Hard Disk Drive Cables

To connect the hard disk drive to the computer, you need to connect two cables: the hard disk drive ribbon cable and a power supply cable.

The hard disk drive ribbon cable is attached to your system board. If you need to remove it for any reason, see "Connecting the drive cable to the system board," below, for instructions on reconnecting the cable to the system board. Otherwise, see page 5-6 for instructions on connecting the ribbon cable and power supply cable to the drive.

You should connect both the hard disk drive ribbon cable and the power supply cable to the drive before you secure it with the mounting bracket. You will not be able to attach them once the bracket is in place.

Connecting the drive cable to the system board

If you need to connect the hard disk drive ribbon cable to the system board, follow the steps below. (If the hard disk drive ribbon cable is already attached to the system board, see "Connecting the drive and power cables to the drive"on page 5-6.)

1. Locate the hard disk drive ribbon cable; it is a flat cable with a connector on each end and an additional connector on the ribbon cable.

system board connector

hard disk drive connector

red wire

---
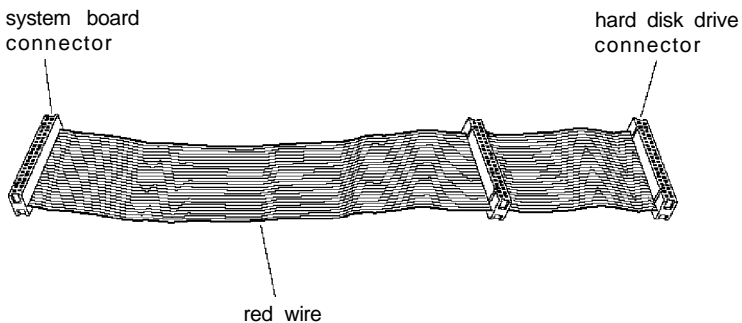
2. Locate the hard disk drive connector on the system board.
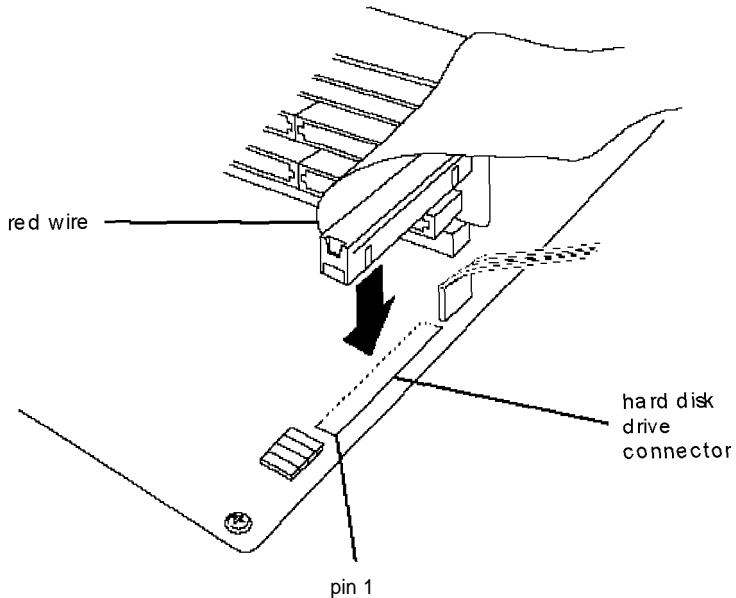
3. Position the system board connector on the cable so that the red wire aligns with pin 1 of the connector on the system board. There is a "1" printed on the system board to identify pin 1.

4. Make sure the holes in the cable connector fit over the pins in the system board connector; then push in the cable connector.

Caution
If you do not correctly align the holes with the pins, you could severely damage your system board when you push in the cable connector.

Connecting the drive and power cables to the drive

Follow the steps below to connect the hard disk drive ribbon cable and a power supply cable to the drive:

1. Locate the hard disk drive connector on the end of the hard disk drive ribbon cable.

2. Locate pin 1 on the drive connector. If you do not see it on the connector casing, turn the drive over so you can see the drive's circuit board, as shown below. There is a "1" or "2" printed on the board to identify the side of the connector containing pin 1.
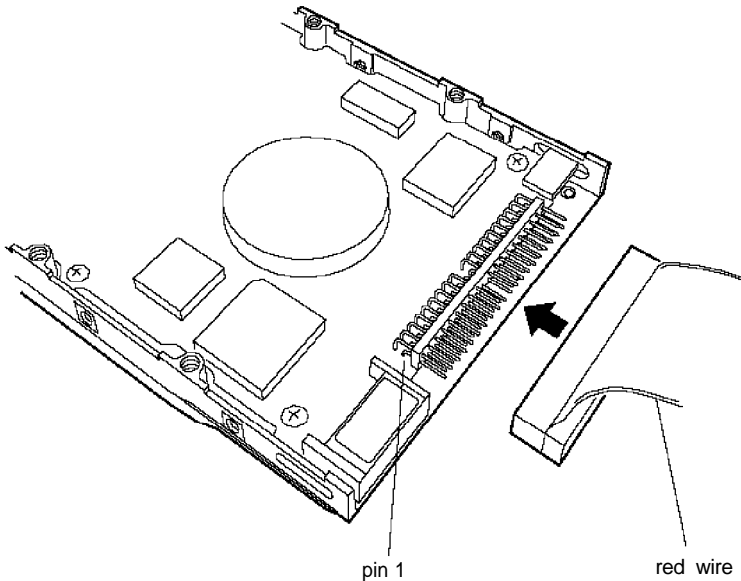
pin 1   red wire

3. Position the connector on the cable so that the red wire aligns with pin 1 on the drive.

4. Make sure the holes in the cable connector fit over all the pins; then push in the connector.

> **Caution**
> If you do not correctly align the holes with the pins, you
> could severely damage your hard disk drive when you
> push in the cable connector.

5. Locate one of the power supply cables that lead from the
   power supply. (They have multi-colored wires and a plastic
   connector on the end .)

6. Position the power supply cable connector so that its notched
   corners line up with the notched corners of the power
   supply connector on the hard disk drive.
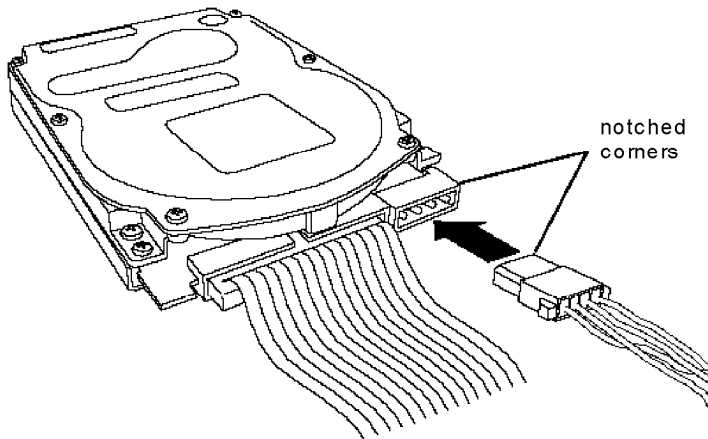
7. Make sure the holes fit over all the pins and then push in the
   connector.

> **Caution**
> If you do not align the cable connector correctly, you could
> severely damage your hard disk drive when you push it in.

Installing the Hard Disk Below the Mounting Bracket

If you have a l-inch tall hard disk drive, you can install it below the hard disk drive mounting bracket. Refer to the illustrations below and follow these steps:

1. Remove the screw securing the mounting bracket to the base of the computer, as shown below.
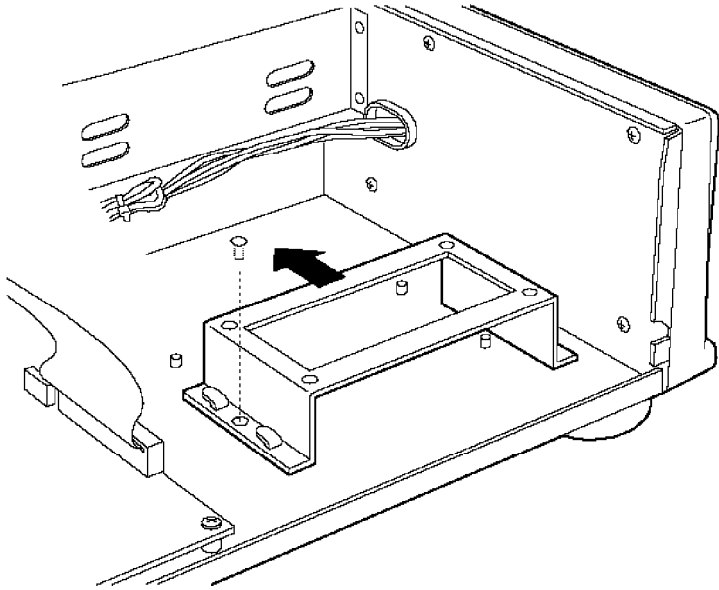
2. Slide the mounting bracket toward the diskette drive bays, as shown above, until the slots clear the tabs.

3. Lift the mounting bracket out of the computer and set it aside.

4. Align the hard disk drive so that the cables lead toward the diskette drive bays and the four screw holes on the base of the drive are above the four pegs, as shown below.

tabs
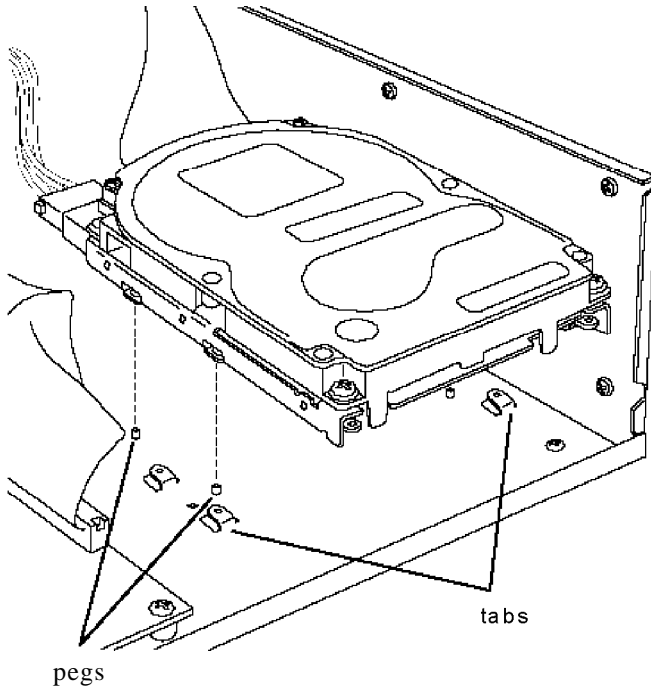
pegs

5. Gently lower the drive over the pegs. When the pegs are inserted in the screw holes on the base of the hard disk drive, the drive will not move from side to side.

> **Note**
> If the drive isn't seated correctly on the pegs, you may not be able to close the cover all the way.

6. Lower the mounting bracket over the hard disk drive, making sure that the slots in the mounting bracket fit over the tabs on the base of the computer.

7. Slide the bracket toward the side of the computer, as shown below, until the tabs hold the bracket in place.
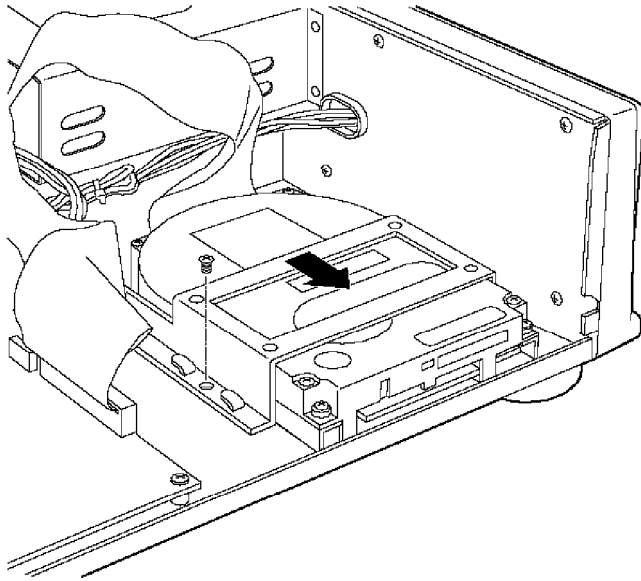
8. Secure the mounting bracket with the screw.

Installing the Hard Disk On the Mounting Bracket

You can install a hard disk drive on top of the mounting
bracket rather than under it. Refer to the illustration of the
mounting bracket on page 5-8 and the one below while
following these steps:

1. Remove the screw securing the mounting bracket to the base
   of the computer and slide the mounting bracket toward the
   diskette drive bays until the slots clear the tabs. (See the
   illustration on page 5-8.)

2. Lift the mounting bracket out of the computer.

3. Turn the hard disk drive over and locate the four mounting
   holes on the drive.

4. Position the bracket on the hard disk drive, aligning the holes
   in the bracket with the holes on the drive.
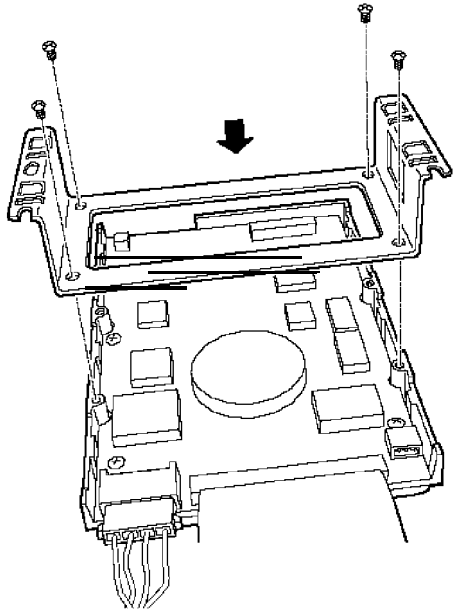
5. Secure the bracket to the drive with four screws

> **Note**
> If you plan to install two hard disk drives, you must use
> flat-head screws to secure the second drive to the
> mounting bracket. You can purchase flat-head screws at
> any hardware store; request this size: #6-32UNC x 8
> FH, M,+. Also, make sure you set the jumpers on both
> hard disk drives to indicate which is the master and
> which is the slave drive. See the documentation that
> came with your drive for instructions.

6. Turn the drive and the mounting bracket over, then slide the
    slots in the mounting bracket under the tabs at the base of
    the computer until the tabs hold the bracket in place.

7. Secure the mounting bracket with the retaining screw.

> **Note**
> If the drive does not fit within the internal bay, you can
> move the mounting frame toward the diskette drive
> bays and align only one set of the slots on the mounting
> bracket with the tabs on the computer. In this case, you
> insert the retaining screw in the front slot on the
> mounting bracket as shown in the following illustration.
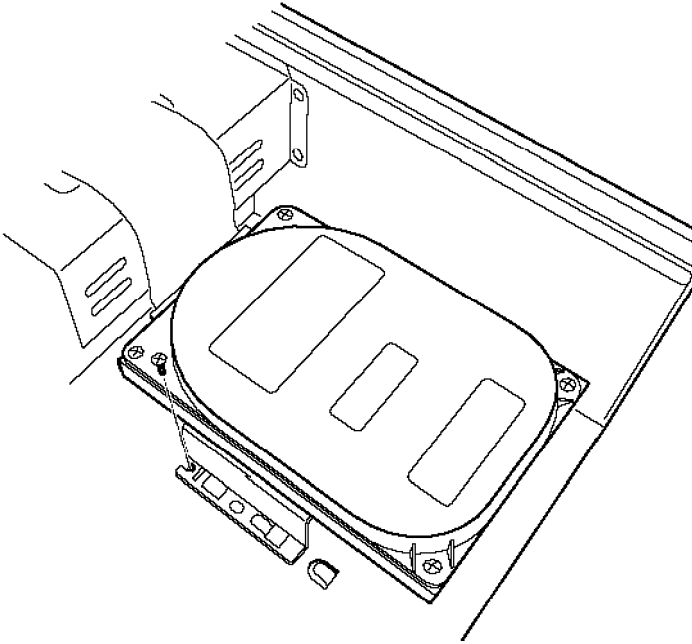
Removing a Hard Disk Drive From the Internal Drive Bay

To remove a hard disk drive, reverse the installation steps outlined above. Then disconnect the hard disk drive ribbon cable and the power supply cable from the back of the drive. When you disconnect the cables, grasp the connectors and pull them straight out so you do not bend the pins; do not pull on the cables. Use the screws to again secure the hard disk drive mounting bracket to the base of the computer.

Installing a Drive in the Upper External Drive Bay

Your system comes with a 3.5-inch diskette drive installed in the lower externally accessible drive bay. You can also install a diskette drive, a tape drive, a CD-ROM, or an optical drive in the upper externally accessible drive bay.

If you are installing a tape drive with a standard 5.25-inch diskette drive connector, you can connect it using the diskette drive cable that came with your system.

Before you install a drive in the upper drive bay, remove the cover. Once you have the drive installed, replace the cover, following the instructions in Chapter 4.

Follow these steps to install a drive in the upper drive bay:

1. Remove the faceplate from the bay by pushing it forward, as shown below.
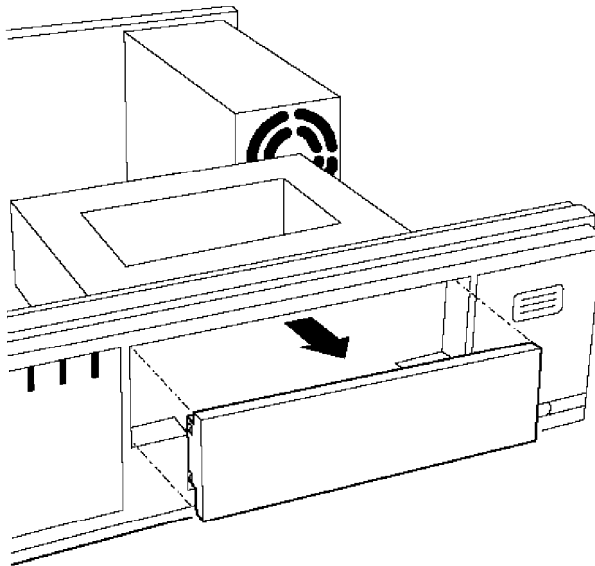
Keep the faceplate in a safe place in case you remove a drive later (or you are installing a drive that you don't need to access).

2. Remove any brackets or mounting frames from the drive. See page 5-3 for instructions.

3. Slide the drive into the bay until it is flush with the front of the computer.
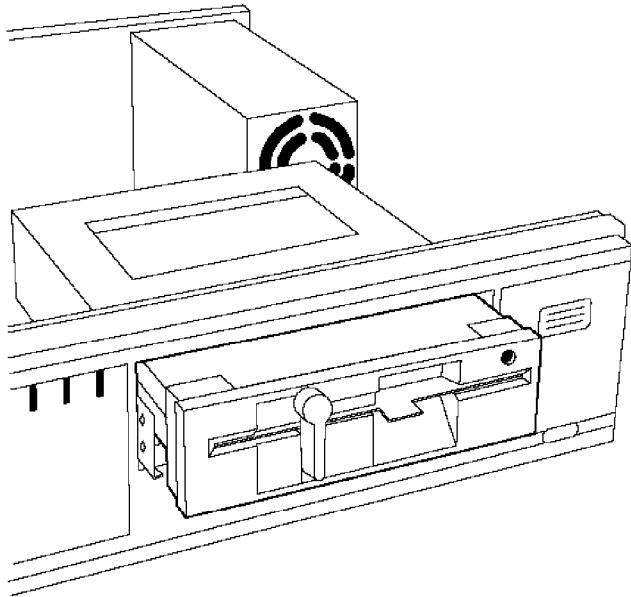
4. Align the slots at the side of the drive bay with the mounting holes in the drive. Then secure both sides of the drive to the drive bay using the retaining screws.
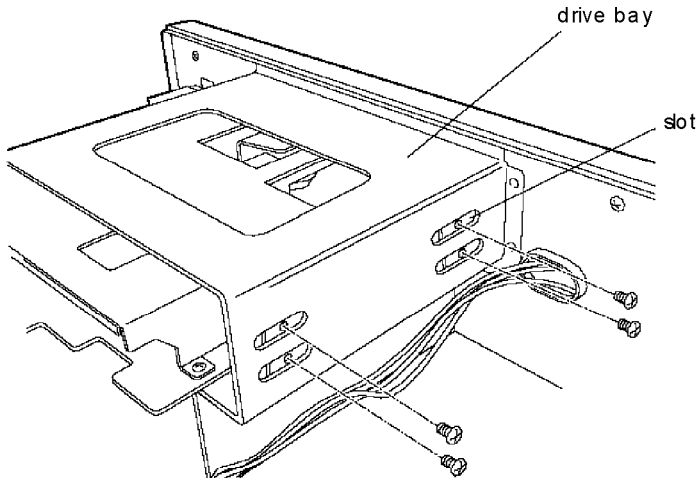
Connecting the Drive and Power Cables

To connect the drive to the computer, you need to connect both the drive ribbon cable and a power supply cable. Follow the steps below.

1. If you are installing a diskette drive, locate the diskette drive ribbon cable. (The connector in the middle of the cable is already connected to the system board.)

2. If you are installing a drive with a card-edge connector, make
    sure you align the key-way (the plastic divider) with the
    gap in the drive connector, as shown below.

    If you are installing a 3.5-inch diskette drive with a header
    connector in the lower bay, see page 5-19 for instructions
    on connecting this cable.
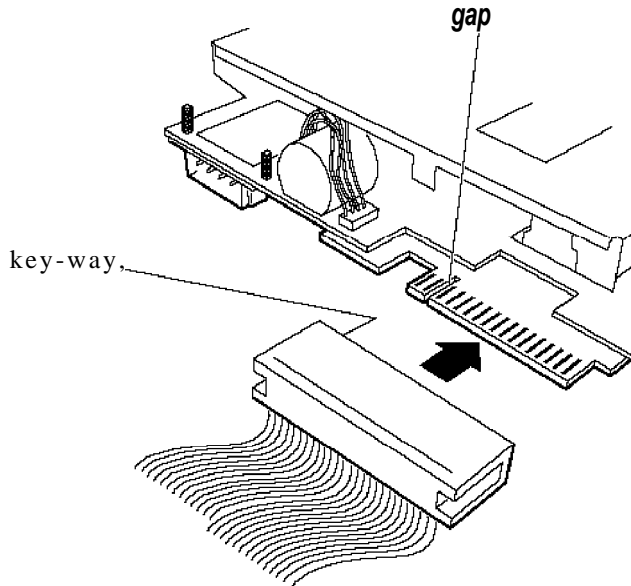
3. Locate one of the power supply cables that lead from the
    power supply. (They have multi-colored wires and a plastic
    connector on the end .)

4. Align the notched corners of the power supply connector with the notched corners of the drive's power supply connector (such as the one shown below). Make sure the holes fit over all the pins and then push in the connector.

notched corners
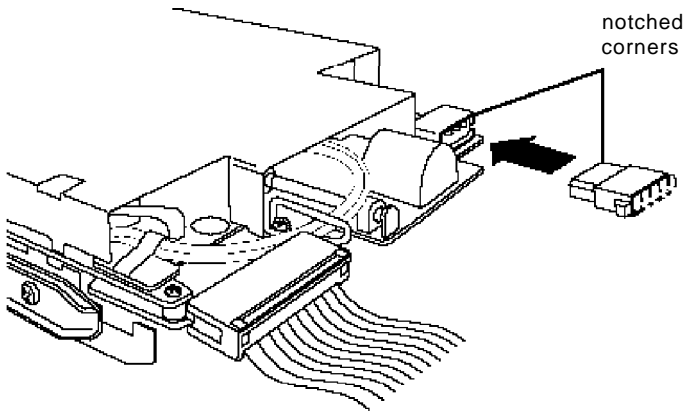
Caution

If you do not align the cable connectors correctly, you could severely damage your drive when you push them in.

If you installed a diskette drive in the upper bay, it is drive B; the lower drive is A. You can change the drive assignments through your operating system or you can purchase a different diskette drive ribbon cable.

Removing a Drive from the Upper Drive Bay

To remove a drive from the upper drive bay, follow these steps:

1. Remove both the ribbon cable connector and the power cable connector from the drive.

2. Remove the screws securing the drive.

3. Reach behind the drive and gently push it to the front of the bay; then pull it out of the slot.

4. Once you have removed the drive, replace the faceplate by inserting one side of the plate, then gently guiding the other side into place. You will hear it snap into place.

Reconnecting the Drive and Power Cables to the Diskette Drive in the Lower Drive Bay

If you had to disconnect the drive and power cables from the diskette drive in the lower bay, refer to the illustration below while you follow these steps to reconnect the cables:

1. Locate the connector on the diskette drive ribbon cable.

2. Identify pin 1 on the drive and align the connector so that the red wire is at pin 1, as shown below. Push in the connector.
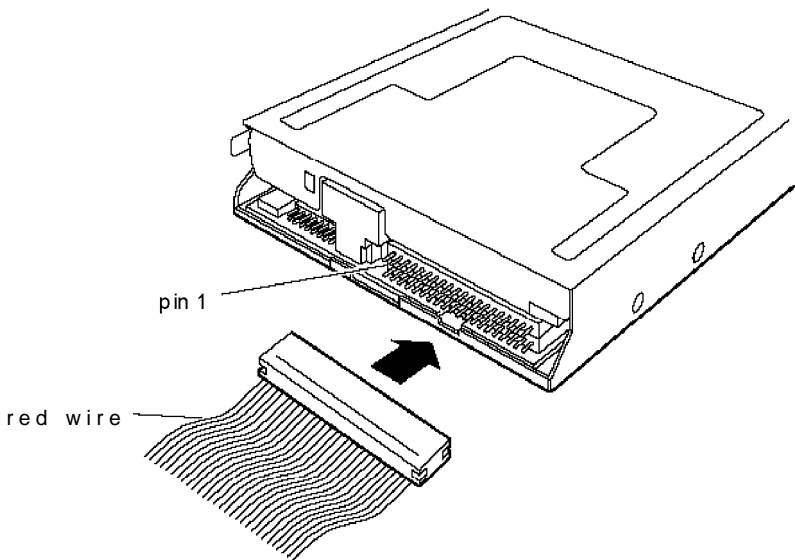
3. Locate the multi-colored power supply cable with the small connector. This cable is attached to the system board rather than the power supply.

4. Position the power supply cable connector so that the holes fit over all the pins. The red wire on the cable will align with pin 1 identified at the power connector on the circuit board of the drive. Push in the connector.

Caution
If you do not align the cable connector correctly, you could severely damage your hard disk drive when you push it in.

Post-installation Procedures

After you install or remove your drive(s) and replace the cover on your computer, you need to run the SETUP program to define the correct configuration for your newly installed drive. See Chapter 2 for instructions.

Chapter 6

Troubleshooting

If you have any problems as you set up and use your computer, refer to this chapter. You can correct most problems by adjusting a cable connection, repeating a software procedure, or resetting the computer.

The troubleshooting suggestions in this chapter are organized in general categories, such as "The computer will not start." Within each category, a more specific problem is described with possible solutions.

If the suggestions here do not solve the problem, perform the steps below to identify your system and make a note of any error messages your computer displays. Then contact your Authorized EPSON Servicer or call the EPSON Connection at (800) 922-8911 (in the U.S.) or (800) GO-EPSON (in Canada).

Identifying Your System

When you request technical assistance, be ready to provide the serial number of your computer, its system BIOS version number, its configuration (including the type of disk drives, monitor, and option cards), and the names and version numbers of any software programs you are using.

Use the guidelines on the next page to locate information about your system.

Serial number:	Look on the back panel of the computer to find the serial number.
System BIOS version:	Restart your system. You'll see the system BIOS version number on the screen when your system performs power-on diagnostics.
System configuration:	Start SETUP and select the System Summary option to see your system 's configuration.
Windows version:	When your computer has loaded Windows, select Help from the menu bar. Then select About Program Manager to see the version number.
Software versions:	In Windows applications, select About from the Help menu, or read the version number from the banner screen displayed when the program starts, or check your software manual.
MS-DOS version:	At the MS-DOS prompt, type VER and press Enter to see the MS-DOS version number.
CONFIG.SYS:	At the MS-DOS prompt, type TYPE C: \CONFIG. SYS and press Enter to see a listing of your system configuration commands.
AUTOEXEC.BAT:	At the MS-DOS prompt, type TYPE C:\AUTOEXEC.BAT and press Enter to see a listing of your system startup commands.

The Computer Will Not Start

The power light is on, but the computer does not start

Replace your main operating system diskette and turn on the computer again.

> **Caution**
> If you turn off the computer, always wait at least 20 seconds before turning it back on. This prevents damage to the computer's electrical circuitry.

The computer does not start and the powerlight is not lit

Make sure the power cord is securely connected to both the AC inlet on the back panel and an electrical outlet.

The power cord is securely connected, but the computer still does not start.

Check the electrical outlet for power. Turn off your computer and unplug the power cord. Plug a lamp into the outlet and turn it on.

You installed or removed system components, and now your computer does not start.

Check to make sure you have reconnected all the internal and external cables correctly.

You may have installed option cards that exceed the system's power requirements. Check the power requirements in Appendix A.

You may have installed a SIMM incorrectly. If the system doesn't find memory, nothing happens. Check that your SIMM(s) are securely installed in their sockets.

If you replace the microprocessor, make sure the new processor chip is installed correctly. Also make sure the jumpers are set correctly and that pin 1 on the chip is connected with pin 1 on the system board. See Chapter 4.

The Computer Does Not Respond

The computer locks up.

Wait a few moments; if your computer does not respond after a reasonable length of time, press Ctrl Alt Del. If that doesn't work, press the RESETbutton.

You may have installed memory using SIMMs that work at the wrong speed. Install the correct SIMMs (see Chapter 4).

Your system may have over-heated. If you are using a DX or DX2 processor, make sure you have an adequate heat sink installed on the chip.

You reset the computer, but it still does not respond.

Try turning the computer off, wait 20 seconds, and turn it on again.

Your computer suddenly stops operating.

You may have overloaded the power supply. See your option card manual(s) for the power requirements for your option card(s). Then check Appendix A to see if you have exceeded the option slot power limits.

Keyboard Problems

The screen displaysa keyboard error message when you turn on or reset the computer.

Make sure the keyboard is securely connected to the keyboard port and not the mouse port.

Nothing happens when you type on the keyboard.

See "The Computer Does Not Respond," above.

The cursor keys on the numeric keypad do not work properly.

If the Num Lock light in the upper right corner of the keyboard is lit, press NumLock to turn off the function.

Monitor Problems

There is no display on the screen.

Check that the monitor's power switch is on and that its power light is on.

The power light is on, but you still do not see anything on the screen.

Check the brightness and contrast controls.

If you still do not see anything on the screen, make sure the monitor is securely connected to the computer.

If you are running an application program, see if you need to set up the program for the type of monitor and display adapter you have. Also make sure you are using the appropriate monitor and display adapter for your software.

The powerswitch is on but the powerlight is not on.

Turn off the monitor's power, wait five seconds, and turn it back on.

If the light still does not come on, check the electrical outlet for power. Turn off your monitor and unplug it from the outlet. Then plug a lamp into the wall outlet and turn it on. If the light turns on, your monitor may be faulty.

Diskette Problems

You see a diskette error message.

Reinsert the diskette, making sure you insert it all the way. If the drive has a latch. turn it down to secure the diskette.

Also, check to see that you have inserted the right type of diskette in the drive. For example, make sure you are not inserting a high-density diskette in a double-density drive.

If reinserting the diskette does not solve the problem, insert the diskette in another diskette drive of the same type. If you can read the diskette in a different drive, your drive may be faulty.

The diskette is the tight type, but you still see an error

Check that the diskette is not write-protected, preventing the drive from writing to the diskette.

Make sure the diskette is form atted. See your operating system documentation for instructions on formatting diskettes.

You may have set the Diskette Access option in SETUP to Supervisor but have logged onto your system using a User level password. See Chapter 2 for information about setting the Diskette Access option and using Supervisor and User passwords.

You may have a defective diskette. Try copying the files from the bad diskette to a new diskette.

Something is wrong with the data in the files

If you are using MS-DOS, run CHKDSK to repair the files. You may also be able to use special utilities or diagnostics to solve this problem.

Diskette Drive Problems

A newly-installed diskette drive is not working properly.

Make sure you have installed the drive correctly and check all the cable connections.

You see a diskette drive error when you start your computer.

Run the SETUP program and configure your system for the correct type of diskette drive.

The diskette drive is making loud or unusual noises

Contact your Authorized EPSON Servicer or the EPSON Connection.

Hard Disk Drive Problems

A newly-installed hard disk drive is not working properly or its performance is not what you expect.

Make sure you have installed the drive correctly and check all cable connections. Also, check the drive's jumper settings.

You see a hard disk drive error when you start your system.

Run SETUP and check that your system is auto-sensing the correct drive type. If auto-sensing is enabled and SETUP displays information that does not match your drive, you may need to define your own drive type. See Chapter 2 for setup information.

Make sure the jumpers on the system board are set correctly Jumper 523 enables or disables the IDE hard disk drive controller. See Chapter 4 for jumper information.

Make sure the jumpers on the hard disk drive are set correctly. See your hard disk drive documentation for more information.

You ate unable to state data on the hard disk drive.

If your drive was not configured, make sure you have partitioned and formatted it correctly for your operating system. See your operating system manual for instructions.

Also, make sure your hard disk drive has been physically formatted by the manufacturer. (All EPSON-supplied drives are physically formatted at the factory.) If it has not been physically formatted, use the format utility that came with the drive to format it before you install the operating system.

Note that a physical format is different from software-based formatting commands, such as the MS-DOS FORMAT command.

You have been using your hard disk drive successfully for some time but notice a redduction in performance.

The data on the disk may have become fragmented. Back up all your data and use a disk compaction utility to reorganize the files on your disk.

If you cannot access data on your hard disk or you are seeing read/ write errors, the disk may have a physical problem. Contact your service representative.

Password Rob/ems

You have forgotten your password.

You must discharge your CMOS memory. To do this, you need to change the setting of jumper 537 to position 3-4. See Chapter 4 for details on changing the jumper.

After you have changed J37, restart the computer, leave it on for a few seconds, then turn it off again. This resets the SETUP values to their factory defaults. Both the Supervisor and the User passwords are disabled.

Set J37 back to position 2-3. Then turn of the computer again. Use SETUP to set a new password, if you want to.

You see a diskette access error message.

You may have set the Diskette Access option in SETUP to Supervisor but have logged onto your system using a User level password. See Chapter 2 for information about setting the Diskette Access option and using Supervisor and User passwords.

Software Problems

The application program does not start

Check that you are following the correct procedure for starting the program and that it is installed correctly. If you do not have a hard disk, make sure the correct diskette is in the diskette drive. If you need help, contact your software manufacturer.

The application program is having trouble reading a key disk.

You may be running an application that requires a slower processor speed. You need to change the processor speed jumper, 522. See Chapter 4 for information on changing the jumper.

Yourapplication haslocked the computer, making it unresponsive to keyboard commands

Reset the computer and try again. If resetting the computer does not help, turn it off, wait 20 seconds, then turn it on again.

Some software, like OS/2,®UNIX,® or Novell® NetWare,® needs a minimum of 8MB to 16MB of RAM to work correctly. Check your software documentation for the minimum memory requirements. If necessary, add additional memory using the instructions in Chapter 4.

Printer Problems

The printer does not work at all.

Check that the printer has power and is properly connected to the computer. Also make sure your printer has paper in it.

The printer prints garbled information.

Check the printer manual for the printer's correct DIP switch or control panel settings.

Also, make sure you have the proper drivers installed for your printer and make sure you've selected the correct printer within your software application.

Option Card Problems

A newly installed option card is not working correctly.

Make sure the option card is installed correctly and is well-seated in its slot. Run the SETUP program to update your computer's configuration after you install the card. Also, perform setup procedures for any software you are using with the option card.

See the documentation that came with the option card to set any necessary DIP switches or jumpers on the card.

The computer may also have some jumpers that must be set for the option card to work properly. See Chapter 4 for system jumper information.

Your system may need to operate at the slower processor speed to access the device. Try reducing the processor speed (see Chapter 3).

Make sure you install option cards that meet the system's power requirements. See Appendix A for power requirements.

An external device connected to the option card is not working correctly.

Make sure you are using the proper cable to connect the device to the card.

Memory Module Problems

The memory count displayed by the power-on diagnostics program is incorrect.

You may have installed the SIMMs incorrectly. They may be the wrong type or speed, or they may not be inserted all the way. See Chapter 4 for information on installing SIMMs.

If you have installed a gold-plated SIMM in one of the sockets, the socket may have corroded slightly. Remove the SIMM and clean the gold-plated connection; then reinstall the SIMM.

Mouse Problems

Yourmouse isn't working properly or you see an auxiliary device error message.

Make sure the mouse cable is securely connected to the mouse port and not the keyboard port. Also make sure you installed the mouse driver correctly (if necessary). See the manual that came with your mouse for instructions. (Windows automatically installs a mouse driver.)

Controller Problems

You see a controller error for the drive controller or the I/O port controllers when you start your system.

The indicated controller on your system board may be faulty. If you have an option card with a controller that will work with your device, you can install it and change the jumper settings on the system board to disable the built-in controller. You can then continue to use your system until it is convenient for you to have it serviced.

Extrenal Cache Problems

The amount of cache displayed by the power-on diagnostics program is inconect.

You may have installed the external cache chips incorrectly. They may be the wrong type, or they may not be inserted all the way.

Also, you may not have changed the SETUP program or the jumpers to recognize the new cache. Make sure you have set the External cache option to Enabled and set both the System shadow and the Video shadow options to Enabled.

See Chapter 4 for instructions on changing the jumper settings or information on installing external cache; see Chapter 2 for instructions on using the SETUP program.

Appendix A

Specifications

CPU and Memory

32-bit CPU   Intel 486SW 25 microprocessor;
upgradable to 486SXJ 33,486DW 33,
486DX2/ 50, or 486DX2/ 66

System speed   Fast and slow speeds available; fast speed
is 25 MHz or the speed of your upgraded
microprocessor, slow speed is 8 MHz;
speed selection through keyboard
commands or jumper setting

To select slow speed, press Ctrl Alt -; to
select fast speed, press Ctrl Alt + (use the
-or + key on the numeric keypad)

Memory   4MB RAM standard on a SIMM;
expandable to 64MB using 4MB, SMB,
16MB, and 32MB SIMMs; SIMMs must
be tin-plated, 72-pin, 32-bit or 36-bit,
fast-page mode type with access speed
of 70ns or faster

ROM   128KB system BIOS, video BIOS, and
SETUP code located in EPROM on main
system board

Video RAM   512KB DRAM on main system board;
expandable to 1MB using 70ns or 80ns,
256 x 4 bit, 20-pin, DIP DRAM chips

Shadow RAM   Supports shadowing of system and video
BIOS ROM into RAM

Memory relocation	Supports relocation of 256KB of memory from A0000h to BFFFFh and D0000h to EFFFFh to extended memory
Cache	8KB of internal cache (built into the microprocessor); supports 64KB, 128KB, or 256KB of external cache using 28-pin, 8K x 8,20ns DIP chips or 28-pin, 32K x 8, 20ns DIP chips
Math coprocessor	Math coprocessor built into the microprocessor for DX and DX2 systems
Clock/ calendar	Contained in the 82C491 system controller along with 64 bytes of CMOS RAM; backed up by a soldered NiCad rechargeable battery

Controllers

Video	Trident® 8900CL VGA controller on main system board; provides resolutions up to 1024 x 768 in 16 colors (up to 1024 x 768 in 256 colors with 1MB of video memory)
Diskette	Controller on main system board supports up to two diskette drives or one diskette drive and one tape drive
Hard disk	Interface on main system board supports up to two IDE hard disk drives with built-in controller; BIOS provides hard disk auto-sensing function

Interfaces

Monitor   VGA interface for fixed or multi-frequency monitor built into system board; 15-pin, D-shell connector

Parallel   One standard S-bit parallel bi-directional interface built into main system board; 25-pin, D-shell connector

Serial   Two RS-232C, programmable, asynchronous interfaces built into main system board; 9-pin, D-shell connectors

Keyboard   PSI 2 compatible keyboard interface built into main system board; 6-pin, mini DIN connector

Mouse   PSI 2 compatible mouse interface built into main system board; 6-pin mini DIN connector

Option dots   Three 16-bit, full-length and two S-bit, half-length I/O expansion slots, ISA compatible, 8.33 MHz bus speed; on systems upgraded to a DX or DX2 processor, one 16-bit slot may be unavailable because of the CPU heat sink/ fan assembly

Speaker   Internal

Mass storage	Internal mounts: Two 31/2-inch wide, one-inch high drives; with three or more option cards installed: the power supply supports only one internal drive
	Externally accessible mounts: One 31/2-inch wide, one-inch high drive and one 51/4-inch wide, half-height drive
Diskette drives	3.5-inch diskette drive, 720KB or 1.44MB storage capacity
	5.25-inch diskette drive, 360KB or 1.2MB storage capacity
Hard disk drives	31/2-inch form factor hard disk drive(s), up to half-height size
Otherdevices	Half-height tape drive, CD-ROM, optical drive, or other storage device; 51/4-inch or 31/2-inch with mounting frames
Keyboard	Detachable, two-position height; 101 or 102 sculpted keys; country-dependent main typewriter keyboard; numeric/ cursor control keypad; four-key cursor control keypad; 12 function keys
SETUP Program	Stored in ROM; accessible by pressing F2 during boot
System security	User and Supervisor level passwords (8 characters) available for system boot or diskette access

Physical Characteristics

width	15.6 inches (396 mm)
Depth	14.5 inches (368 mm)
Height	4.1 inches (104 mm)
Weight	15 lb (6.8 kg), without drives or keyboard

Power Supply

Type	65 Watt, UL listed, fan-cooled
Input ranges	110-240 VAC
Maximum outputs	+5 VDC at 7.5 Amps, -5 VDC at 0.1 Amp, +12 VDC at 2.0 Amps, -12 VDC at 0.2 Amp
Frequency	50/60 Hz
Cables	Two to main system board; four to mass storage devices

Option Slot Power Limits

Maximum current	+5 Volts	−5 Volts	+12 Volts	−12 Volts
For all slots*	4.6 Amps	0.1 Amp	1.5 Amps	0.1 Amp

* Based on a system containing one hard disk drive and one diskette drive.

Environmental Requirements

Condition	Operating range	Non-operating range	Storage range
Temperature	41° to 90° F (5° to 32° C)	−4° to 140° F (−20° to 60° C)	−4° to 140° F (−20° to 60° C)
Humidity (non-condensing)	20% to 90%	10% to 90%	10% to 90%
Altitude	−330 to 9,900 ft (−100 to 3,000 m)	−330 to 39,600 ft (−100 to 12,000 m)	−330 to 39,600 ft (−100 to 12,000 m)
Maximum wet bulb	68° F (20° C)	104° F (40° C)	134° F (57° C)
Accoustical noise	46.2 dB	N/A	N/A

Video Resolutions and Colors

Resolution	Memory requirements	Colors	Vertical frequencies (Hz)	Remarks
640 × 480	512KB	256	60/72	8 bits/pixel
	1MB	256	60	16 bits/pixel
800 × 600	512KB	256	56/60/72	4 bit planes
	1MB	256	56/60/72	8 bits/pixel
1024 × 768	512KB	16	43.6/60/70/72	4 bit planes*
	1MB	256	43.6/60/70/72	8 bits/pixel *

* Non-interlaced and interlaced

Tested Operating Environments

Although your system will run most software applications: the following operating environments have been tested for compatibility with your system.

Microsoft MS-DOS versions 3.l and later
Novell DR DOS®
Novell NetWare*2.2,3.12, and 4.01
Novell NetWare Lite
IBM OS/ 2
SCO® UNIX
SCO Open Desktop
Microsoft Windows 3.0 and later
Microsoft Windows WorkGroups
Microsoft Windows NT

* Certified as workstation tested as File Server

Your system has also received Novell's "Yes, NetWare tested and approved certification as a workstation. As new environments become available, these also will be tested.

Options Available from EPSON

Many options for enhancing and supplementing this product are available from EPSON, including the following:

Monitors
Keyboards
Mass storage devices
Printers
Operating system software

Call your nearest marketing location for more information about specific options.

Hard Disk Drive Types

Type	Size* (MB)	Cyl- inders	Heads	Sectors/ track	Landing zone	Write pre- comp	Drive name
1	85	903	4	46	903	None	CP30084E
2	121	762	8	39	761	None	CP30104H
3	106	1024	12	17	1024	None	
4	65	940	8	17	615	300	
5	49	940	6	17	940	512	
6	170	903	8	46	903	None	CP30174E
7	171	332	16	63	332	None	
8	213	1024	12	34	1024	None	
9	117	900	15	17	901	None	
10	341	768	14	62	768	None	
11	528	1024	16	63	1024	None	
12	52	855	7	17	855	None	
13	170	1010	6	55	1010	None	AC1170
14	255	1010	9	55	1010	None	AC2250
16	341	1010	12	55	1010	None	AC2340
17	212	989	12	35	989	None	
18	59	977	7	17	977	None	
19	62	1024	7	17	1023	512	
20	31	733	5	17	732	300	
21	127	919	16	17	919	None	ELS127A
22	31	733	5	17	733	300	
23	170	1011	15	22	1011	None	ELS170A
24	245	723	13	51	723	None	LPS240A
25	252	895	10	55	895	None	CP30254

Hard disk drive types (continued)

Type	Size* (MB)	Cyl- inders	Heads	Sectors/ track	Landing zone	Write pre- comp	Drive name
26	343	665	16	63	665	None	CP30344
27	528	1024	16	63	1024	None	
28	42	977	5	17	977	None	
29	131	1002	8	32	1002	None	
30	245	967	16	31	967	None	
31	345	790	15	57	790	None	
32	42	809	6	17	809	128	
33	50	830	7	17	830	None	
34	72	830	10	17	830	None	
35	44	1024	5	17	1024	None	
36	71	1024	8	17	1024	None	
37	42	615	8	17	615	128	
38	109	1024	8	26	1024	None	
39	72	925	9	17	925	None	
40	80	1024	9	17	1023	None	
41	119	918	15	17	917	None	
42	133	1024	15	17	1023	None	
43	143	823	10	34	822	None	
44	84	969	5	34	968	None	
45	118	969	7	34	968	None	

* Actual formatted size may be slightly different than size on drive label; you cannot change thisvalue.

Drive Option Information

Hard disk drive options for high-capacity, 1-inch IDE drives

Parameters	Conner®				Quantum®	Western Digital®	
	CP-30254	CP-30344	CFS420A	CFA540A	LPS240AT	AC2250	AC2340
Formatted capacity (MB)	250	340	426.3	540	245	240	340
Size, width × height (in)	4 × 1	4 × 1	4 × 1	4 × 1	4 × 1	3.5 × 1	3.5 × 1
Weight (lb)	1.2	1.2	1.16	1.16	1.05	1.12	1.12
Cylinders	1895	2116	2388	2805	1818	2233	2233
Disks	2	2	2	2	2	2	2
Heads	4	4	4	4	4	3	4
Sectors per track	62	63-95	63-100	72-114	44-87	56-96	56-96
Rotational speed (RPM)	4542	4500	3600	4500	4306	3322	3322
Buffer size (KB)	64	64	32	256	256	64	128
Average seek time (ms)	14	13	14	12	16	<13	<13
Encoding method	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7
Power dissipation (seek)	3.75 W	3.75 W	5.12 W	5.7 W	4.9 W	5.2 W	5.2 W
Logical parameters Cylinders Heads Precomp zone Landing zone Sectors	895 10 0 895 55	655 16 0 655 63	826 16 0 826 63	1048 16 0 1048 63	723 13 none* 723 51	1010 9 1011 1011 55	1010 12 1011 1011 55

* Select 1 or none for the precomp value. If neither of these optionsare available, select the maximum available precomp value.

IDEhard disk drive jumpersettings

Model number	Single drive	Master drive	Slave drive
Conner CP30254	C/D jumpered	C/D jumpered	No jumpers
Conner CP30344	C/D jumpered	C/D jumpered	No jumpers
Conner CFS420A	C/D jumpered	C/D jumpered	No jumpers
Conner CFA540A	C/D jumpered	C/D jumpered	No jumpers
Quantum LPS240AT	DS jumpered *	SP and DS jumpered *	No jumpers *
Western Digital AC2250	No jumpers	MA jumpered	SL jumpered
Western Digital AC2340	No jumpers	MA jumpered	SL jumpered

* CS(cable selection) can be jumpered for any configuration. When CSis used, the drive is a master if pin 28 isgrounded and a slave if pin 28 is not grounded.

Connector Pin Assignments

Parallelport connectorpin assignments (CN3)

Pin	Signal	Pin	Signal	Pin	Signal
1	Strobe	10	ACK*	19	Signalground
2	Data 0	11	Busy	20	Signalground
3	Data 1	12	PE	21	Signalground
4	Data 2	13	Select	22	Signalground
5	Data 3	14	Auto*	23	Signalground
6	Data 4	15	Error*	24	Signalground
7	Data 5	16	Init*	25	Signalground
8	Data 6	17	Selectin*		
9	Data 7	18	Signal ground		

*Active low logic

Serial port connector pin assignments (CN4 and CN5)

Pin	Signal	Pin	Signal
1	Data carrier detect	6	Data set ready
2	Receive data	7	Request to send
3	Transmit data	8	Clear to send
4	Data terminal ready	9	Ring indicator
5	Ground		

DMA Assignments

Level	Width	Assigned device
DMA0	8-bit	Reserved
DMA1	8-bit	Reserved
DMA2	8-bit	Diskette drive controller
DMA3	8-bit	Reserved
DMA4		Cascade for DMA controller 1
DMA5	16-bit	Reserved
DMA6	16-bit	Reserved
DMA7	16-bit	Reserved

Hardware Interrupts

Master	Slave	Function
IRQ0		Timer output 0
IRQ1		Keyboard
IRQ2	IRQ8	Real-time clock
	IRQ9	Reserved
	IRQ10	Reserved
	IRQ11	Reserved
	IRQ12	PS/2 mouse
	IRQ13	Math coprocessor
	IRQ14	Hard disk drive controller
	IRQ15	Reserved
IRQ3		Serial port 2
IRQ4		Serial port 1
IRQ5		Parallel port 2
IRQ6		Diskette drive controller
IRQ7		Parallel port 1

System Memory Map

000FFFFFFh	
	128KB ROM Duplicated from 0E0000h
000FE0000h	
	64MB (Maximum system memory)
	Extended memory
00100000h	1MB
	128KB system ROM
000E0000h	
	Unused or I/O expansion ROM (160KB reserved for ROM on I/O adapter)
000C0000h	
	128KB ROM Reserved for ROM on I/O adaptor
000A0000h	640KB
	640KB Conventional system memory
00000000h	
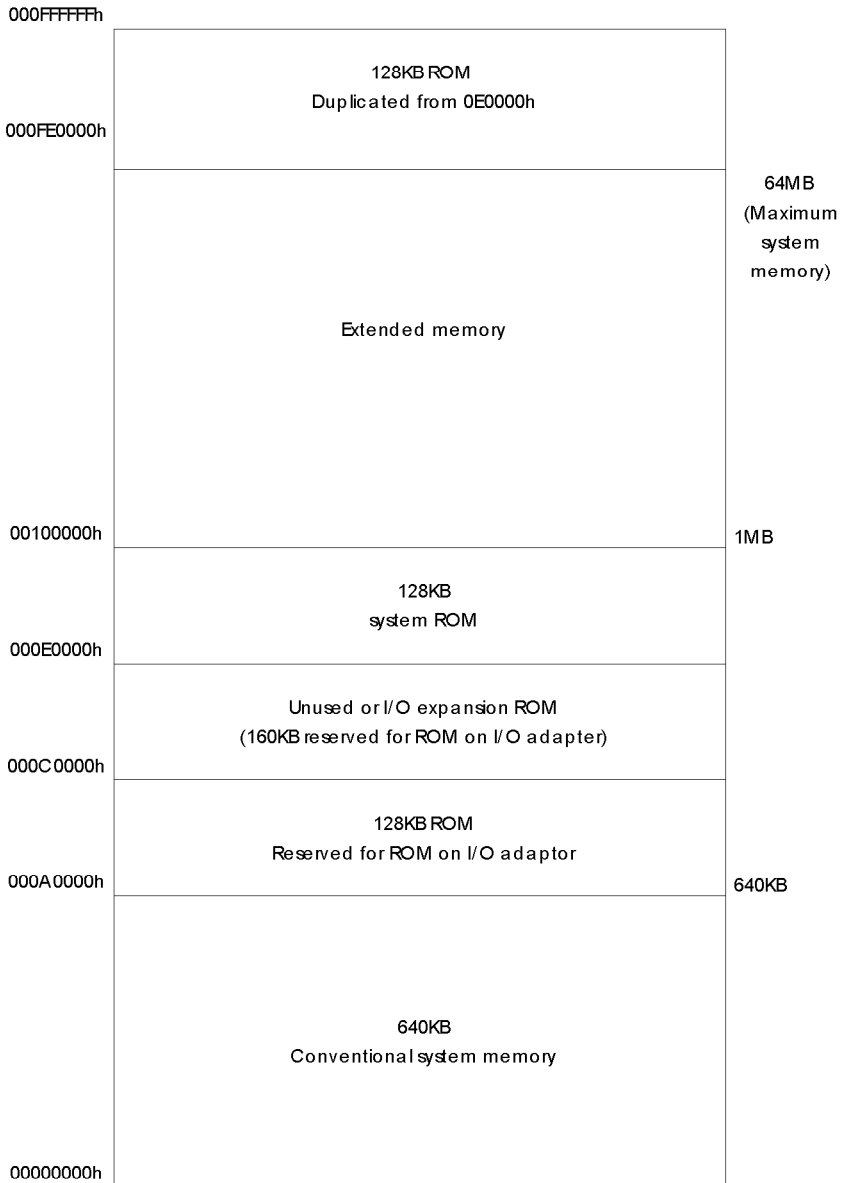
System I/O Address Map

Hex address	Assigned device
000 - 01F	DMA controller 1, 8237
020 - 03F	Interrupt controller 1, 8259
022 - 024	UMC 82C491 configuration register
040 - 05F	Timer, 8254
060 - 06F	Keyboard controller, 8042
070 - 07F (CMOS)	Real-time clock NMI (non-maskable interrupt) mask
080 - 09F	DMA page register, 74LS612
0A0 - 0BF	Interrupt controller 2, 8259
0C0 - 0DF	DMA controller 2, 8237
0F0	Clear math coprocessor busy
0F1	Reset math coprocessor
0F8 - 0FF	Math coprocessor
1F0 - 1F8	Hard disk
200 - 207	Game I/O
278 - 27F	Parallel printer port 2
2B0 - 2DF	Alternate enhanced graphics adapter
2E1	GPIB (adapter 0)
2E2, 2E3	Data acquisition (adapter 0)
2F8 - 2FF	Serial port 2
300 - 31F	Prototype card
360 - 363	PC network (low address)
368 - 36B	PC network (high address)
378 - 37F	Parallel printer port 1
380 - 38F	SDLC, bisynchronous 1
390 - 393	Cluster

Hex address	Assigned device
3A0 - 3AF	SDLC, bisynchronous 2
3B0 - 3BF	Monochrome display and printer adapter
3C0 - 3CF	Enhanced graphics adapter
3D0 - 3DF	Color graphics monitor adapter
3F0 - 3F7	Diskette drive controller
3F8 - 3FF	Serial port 1
6E2, 6E3	Data acquisition (adapter 1)
790 - 793	Cluster (adapter 1)
AE2, AE3	Data acquisition (adapter 2)
B90, B93	Cluster (adapter 2)
EE2, EE3	Data acquisition (adapter 3)
1390 - 1393	Cluster (adapter 3)
22E1	GPIB (adapter 1)
2390 - 2393	Cluster (adapter 4)
42E1	GPIB (adapter 2)
63E1	GPIB (adapter 3)
82E1	GPIB (adapter 4)
A2E1	GPIB (adapter 5)
C2E1	GPIB (adapter 6)
E2E1	GPIB (adapter 7)

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